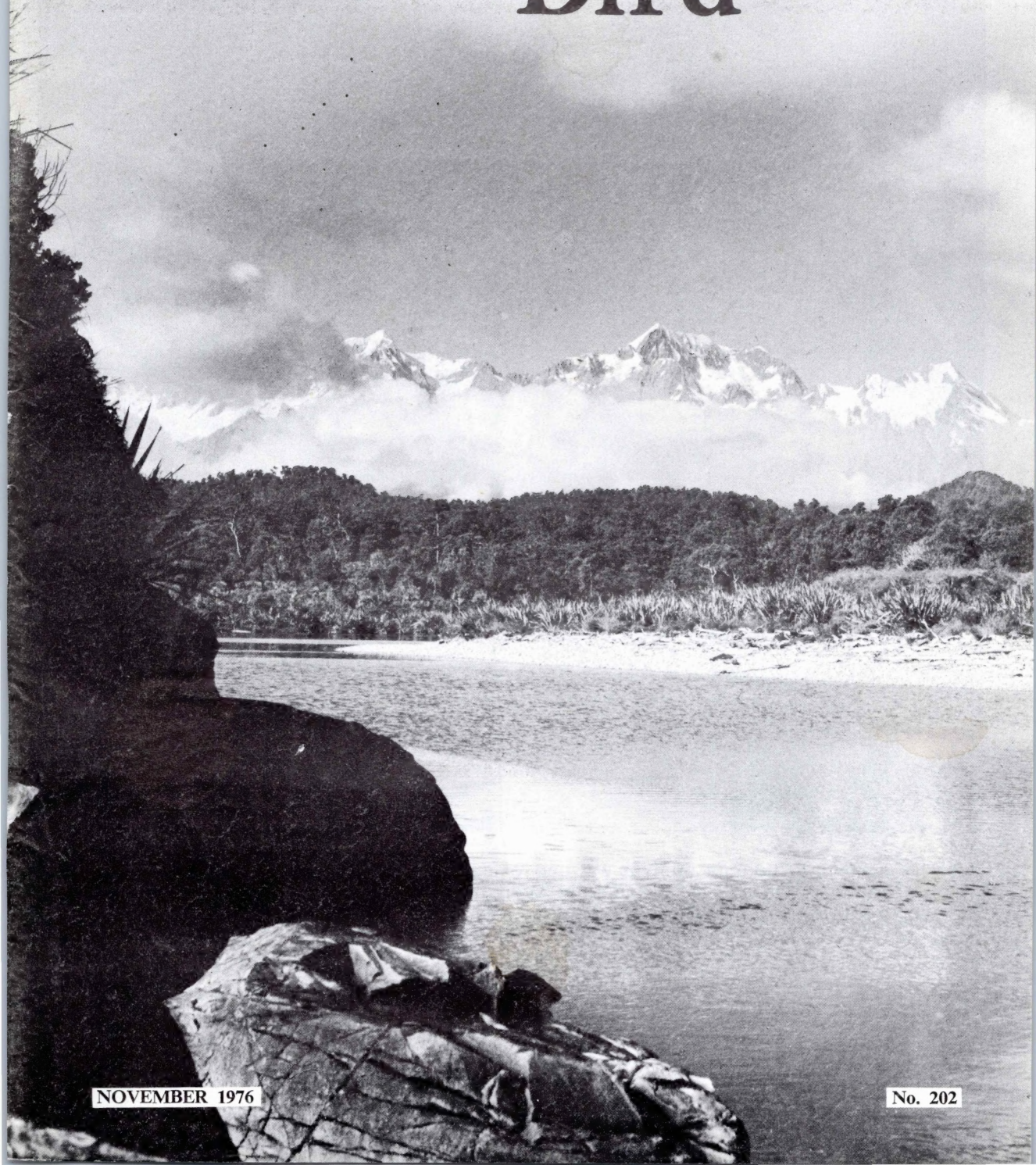
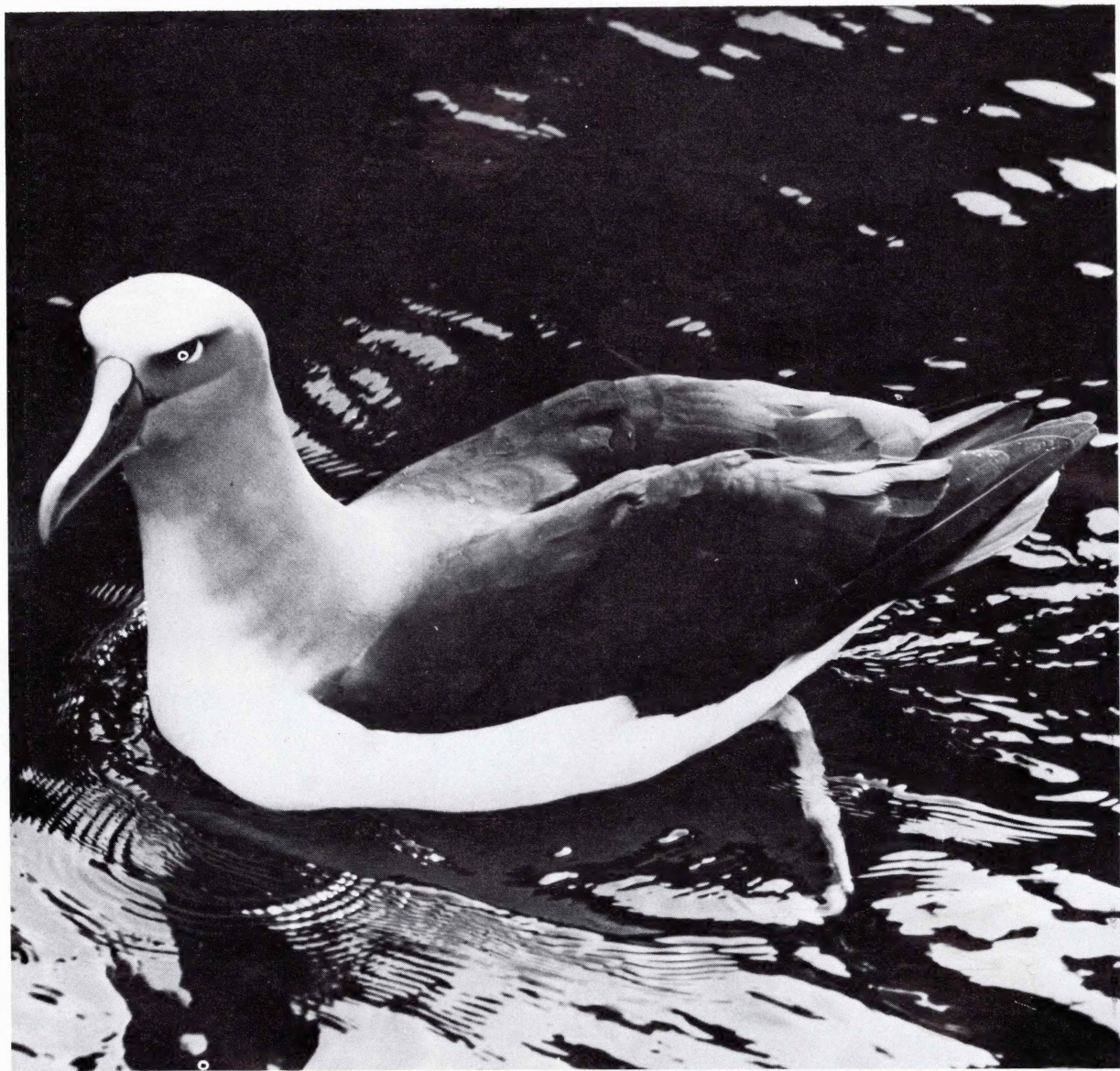


Forest and Bird



NOVEMBER 1976

No. 202



Wildlife Service photo by J. L. Kendrick

The handsome Buller's mollymawk, one of several species of mollymawk that range the Southern Ocean. It is generally seen round the southern coast of the South Island and near Stewart Island, but has been observed in northern New Zealand.

Forest and Bird

Journal of the Royal Forest and Bird Protection Society
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IN THIS ISSUE

Searching for kakapo in Fiordland	2
Presentation of proceeds of Maud-Mangere Islands Appeal	7
New Zealand lizards	8
Waikato Branch's displays	12
Rare and endangered New Zealand birds	13
Single policy for Okarito and Waikukupa State Forests	17
Conservation report	19
Red admiral butterfly	23
Society opposes petition on thar	25
Town and country planning	27
Support for planting eucalypts	31
The Junior Section	34

COVER: Mt Cook (to right of centre) towers above the Waikukupa State Forest (see page 17) and Waikowhai Stream. This view from Gillespies Point, West Coast, also includes Mt Tasman (left) and La Perouse (right). David E. Harding photo.

Contributors to *Forest and Bird* may express their opinions on contentious issues. Those opinions are not necessarily the prevailing opinion of the Royal Forest and Bird Protection Society.

Registered at P.O. Headquarters,
Wellington, as a magazine.

Total conservation

MANY of us are asking whether our Society should interest itself in problems that do not bear directly on the preservation of our native birds and forests. Others protest that as a conservation agency our name is quaint and restrictive. I myself am more concerned with what we do than with what we are called and derive some pleasure from our name, which describes our origins so explicitly.

"Total conservation" is a catch phrase that is becoming popular with us. To what extent are we to be concerned with the whole range of threats to natural habitats and environment? Any preconceived restrictions must do us a disservice. Anyone troubled with one particular encroachment on the natural order will soon realise the extent of the chain reaction that not only follows from the encroachment he criticises but also from his attempt to stem it.

Often social and economic adjustments follow any change of the physical environment. You cannot stop cutting down trees without affecting the sawmillers and in turn the building industry and so on. You cannot withhold nuclear power without putting strain on other power resources like lakes, rivers, oil, and gas.

Now, if we campaign against reclaiming estuaries for urban development, should we not also involve ourselves with town planning and city planning? We cannot be known only as people who demand that others stop doing what they want to; we must be involved with wide solutions and wider education.

We are, however, limited in the usual way by manpower and finances. By the time you receive this issue our Society will have had another year full of hard work with some worthwhile achievements. Membership is increasing daily. We have raised large sums for our primary concern for wildlife — Maud Island for the kakapo and Mangere Island for the black robin. We have led campaigns for the preservation of forests, both small and large. The effort and expense have been considerable.

I would not like to think that our Society is to be in any way limited in its approach to any one of the problems we observe and tackle. On the other hand, I am convinced that if we could say at any particular time we had done something to protect our forests and birds, we could not have helped but improve the quality of man's participation in nature and total conservation.

If the horizons are not limited, we will then best be able to honour our name.

— A. A. T. Ellis, President

Searching for the rare kakapo in Fiordland

PREVIOUS articles in *Forest and Bird* (February and May 1976 issues) have dealt with the quest for the kakapo in Fiordland by the Wildlife Service of the Department of Internal Affairs. One of the members of the field parties engaged in this work, John Aspinall, a 25-year-old graduate of Lincoln College, who now works at the Mt Aspiring Station, in the Matukituki Valley, describes in this article his impressions of the trips he made with the Wildlife Service in kakapo country.

LATE in 1975 and again in March 1976 I joined the Wildlife Service as a volunteer helping in the search for the extremely rare and fascinating kakapo in the rugged and isolated regions of Fiordland.

Full of anticipation I met the rest of the team in Te Anau and we drove over to Milford, meeting the charac-



Wildlife Service photo by P. Morrison

The head of the Tutoko Valley. The valley floor shown here contained a number of kakapo in the 1960s.

teristically steady rain. The afternoon was spent packing gear for two four-men parties, a difficult task with eight men plus gear in a 12 ft by 16 ft hut.

Harrison Valley

A helicopter from Te Anau took us to where we were to search the rugged, isolated

Harrison Valley, which enters Milford Sound from the north and which had seldom been visited.

In the first trip four members made a reconnaissance flight and selected camp sites. We followed, with gear suspended below the helicopter in a sling. We had magnificent views of the precipitous slopes of Mitre Peak and the steep



Wildlife Service photo by R. Morris

The kakapo arena in the Transit Valley. Two kakapo were booming about half way up the steep direct ridge to the peak at the right centre. Another was at its foot, and the fourth was on the ridge face between.

bush-clad slopes of the Harrison, with Mts Pembroke and Grave towering above.

We soon reached the selected camp site and the helicopter left us cold and forlorn beside a pile of gear. The scrub was dripping wet, fresh snow and ice were on the cliffs, and the sun was not due for an hour. This was rather a shock to the body; it takes some time to adjust from the comforts of civilisation to roughing it in the wild. The answer is to get moving; so 6 hours of solid work later we had dug level camp sites out of the hillside and erected two 8 ft x 6 ft tents and a kitchen fly. We enjoyed the first meal in our new home.

Now it was time to look for kakapo. We worked our way four abreast up a densely scrub covered ridge. Several times I took a specimen to our leader and asked "Is this feed-

ing sign?", but it never was. Gradually I got a better idea of what to look for.

Superb view

At the ridge top we sat in the sun and admired the view, which was superb. Being so close to nature on a warm sunny day induces such a feeling of serenity that one could sit for hours. Even the sandflies couldn't destroy it, though they tried hard. But it was time to search down the other side of the ridge and back to camp to cook tea. Then we were off to bed to listen to kiwis and moreporks calling until we fell asleep.

On a typical day we would breakfast about 8 a.m., pack lunch, camera, and parka into a rucksack, and go out to search likely areas. We would concentrate on garden areas, where the birds feed, and

steep prominent ridges where bowls may exist. We had to move slowly and observe keenly and so would notice all manner of existing plants, birds, and insects. Often one travels through bush too fast to notice all the fascinating details.

We spent 5 fine days in this part of the Harrison Valley, but the only sign found was some very old droppings under a large rock overhang in the Selwyn Creek tributary under the towering cliffs of Mt Grave.

Pembroke Creek

A few days later two of our party flew out, and Les Scown and I flew into Pembroke Creek, a tributary of the Harrison River. We set up camp among some scrub under the icefields of Mt Pembroke.

Above towered a spectacular cirque with sheer rock faces extending a mile or so down either side of the valley; it was certainly a beautiful area.

In 3½ days' searching we found no sign of kakapo. But kakas could be seen and heard almost continuously, screeching, whistling, and chortling away. Pigeons, bellbirds, tomtits, fantails, brown creepers, grey warblers, waxeyes, rifle-men, rock wrens, and keas were all common and friendly.

After a spell of 8 reasonably fine days the next 2 days were spent sleeping, eating, reading, and writing while the rain poured down. We did not mind this much until a creek overflowed through our kitchen and we had to undertake some diversion work. The streams rise and fall incredibly fast. We became thoroughly sick of rain, but it lifted enough for us to be flown out to Milford, where we spent 1½ days while it continued to pour down.

Tutoko bench

When the weather cleared we dried our gear and packed for the next trip. Les and I were to search a large bench high on the eastern faces of the Tutoko Valley. Early on Monday morning we flew to our camp site amid magnificent scenery.

The valley floor is bush clad, but the flats and terraces abruptly give way to sheer rock faces topped by icefields. Near the head of the valley Mt Tutoko towers over all and is flanked by the Age Glacier and Ngapunatoru ice plateau. Our ledge was the only one of any consequence in the entire valley. Above rose stark rocky peaks; below were steep scrubby faces.

Success

Having set up camp, we set off on a reconnaissance. We were wandering back to camp when suddenly my heart leapt. There before us were some classic kakapo chews on a speargrass (*Aciphylla* sp.). A quick look revealed more; so we hurried back to the evening radio schedule with our exciting news.

Next day we searched under a steep face below the chews and found plenty of droppings, both old and recent, under large overhanging rocks, plus a feather. An arduous scramble took us up the face and on to the plateau, where we found many recent chews on speargrass, mountain flax, sedge (*Schoenus pauciflorus*), and mountain daisy (*Celmisia* spp.) and some very fresh droppings. So after an interesting and satisfying day we had conclusive evidence that at least one bird was present.

After 2 wet days in camp we were back and found that the territory extended over 30 to 40 acres, a large area. We also discovered a recently used track and bowl system which was rather unusual, because through lack of suitable rocks, the bowls were just scooped out of the slope, not against rocks as is usual. This find was exciting, but also a little disappointing, as we had hoped to discover a female.

Later we crossed a steep narrow creek via avalanche snow and scrambled up rock slabs to reach the steep rocky ridge at the northern end of the ledge. Here were more feeding signs and two track and bowl systems, one of which had been cleared a little, presumably in preparation for booming. There were

obviously males present; so could there be females too?

Screech call

The following night we slept out in one bird's territory and sat up until 12.30 a.m., hoping to hear a screech call, but had no luck. The next night we played tape-recorded screech calls until midnight and had just begun to return to camp when from high up on the ridge came a shrill, raucous screech, the type that would send shivers up your spine if you did not expect it. But we knew what it was and it brought smiles to our faces. Though we played tapes on the territories until about 1 a.m. on four nights, this was the only response we got.

Then came the most unpleasant 5 days of the trip. We had rain, snow, hail, and wind, and being at 1050 m we were exposed to the lot. We spent the time sleeping, reading, writing, and watching the puddle grow in the bottom of the tent. We ventured out only when hunger drove us for a meal. And at the end of it all we felt tired and lethargic, not rested or active.

"Hooki" the kea had sampled our food and decided he liked it. When we packed it away in boxes he chewed holes in the wood and reached through. Our rubbish bag was ripped open and contents were scattered.

Sighting

The weather finally cleared and we went over to check on apples and potatoes that we had placed around the territories. As we neared the crest of the ridge about 8 p.m. a kakapo came waddling over to meet us. On seeing us, he moved off under a tree and stood while we watched him.



Wildlife Service photo by R. Morris

View southwards along the Tutoko bench, with Mt Underwood in the background. The scrub- and bush-covered slopes in the foreground contained many feeding signs of one or possibly two kakapo.

It was a real thrill to see a kakapo in the wild — the highlight of my trip.

Last chance

When another party flew into the area on 3 January, there were three birds booming. This was unexpected, because the previous season was a booming one, and it had been thought that they did not boom on consecutive years. It is likely that any females in the area would have mated and been off nesting by 3 January.

In future it will be necessary to sit by all males all night, on every night from the very first night of booming, in case a female arrives; she can then be caught and transferred to Maud Island. This appears to be the only hope of survival for the kakapo, but adequate finance and manpower will be needed.

We later found that the large territory we thought was occupied by one bird was actually two territories holding two males.

It was interesting that the second kakapo had two track and bowl systems, one in the tussock at 1100 m, which he had cleared shortly before we found it. He subsequently boomed from the lower one, which he had not been working on during our stay, though he had been living in the area.

Other common bird species were abundant on the bench, especially rock wrens, which were very tame. Kiwis were right up in the snow tussock.

Transit - Poison Bay

In early March this year I returned to Fiordland, this time for 2 weeks. I was to join the team in the Transit

Valley, south of Milford Sound. Three birds had recently been discovered booming into a vast arena, and during my stay a fourth was found in the same area.

I joined Rod Morris across the valley from the kakapo and we spent a week searching unsuccessfully. We were at 1050 m, just below the crest of a ridge dividing Transit Valley from the coastal slopes. From the crest we had a magnificent view of the Transit and miles of coastline in either direction. Though not as high as the Harrison-Tutoko country, the landscape was still very steep and broken.

For the second week we moved along the ridge and camped on the slopes overlooking Poison Bay. We were hampered by being confined to camp by rain for 7 days, and we had rain on 3 other days, out of a total of 15.

This area has obviously held many kakapo not long ago. We found seven conspicuous track and bowl systems, with 60 to 80 fairly well-defined bowls. This seems to be typical of the whole Transit Valley and the western coastal slopes overlooking Poison Bay. But only four birds could be found.

We spent an interesting day visiting Lake Ronald, where we watched a pair of crested grebes diving for food and feeding their young and chasing off intruders. The lake is surrounded by rusty-red brittle rock which is green inside when broken. Only a little stunted vegetation survives. Apparently a belt of greenstone passes below. We also saw a pair of tuis, the only ones I saw in Fiordland.

As before, birdlife was

abundant. Kiwis were very common and we had a close look at one. A weka, keas, kakas, and rock wrens were friendly.

Noxious animals

I was most disappointed to find evidence of stoats and mice in all areas we visited. The kakapo is extremely vulnerable to attacks by stoats, and I think this is probably the major reason for the rapid decline in numbers. The kiore rat may also have preyed on eggs and young.

Deer have been reported in all areas, but very seldom and only on valley floors. Chamois exist in the Harrison-Tutoko area, but are well under control.

Opossums are moving up the Harrison Valley and are

in the Tutoko Valley to snow tussock level, but they have not yet reached the Transit-Poison Bay area.

Vegetation

I found the Transit-Poison Bay area very interesting because it is probably the area of New Zealand least modified by human interference. Only stoats, mice, and occasional deer are found there. New Zealand virgin bush is often referred to as impenetrable trackless jungle, but we generally found it reasonably easy to move through, and there were many clearly defined tracks on ridge crests presumably made by kiwis, wekas, and kakapos.

The vegetation species were similar to those in the Matukituki Valley, where my home is (Mt Aspiring National Park), but the difference in abundance and distribution through the absence of browsing animals was remarkable. Lush, palatable plants abound there on all sites, but where deer are present these plants are confined to steep, inaccessible areas, and a few unpalatable species colonise accessible areas.

I was impressed with the enthusiasm and dedication of the Wildlife Service men. Conditions were often difficult, but they got on with the job efficiently, often working long hours.

Rewarding experience

I found my opportunity to help in the struggle to save one of the world's rarest birds a rewarding experience.

The kakapo is a fascinating and unusual bird, well worth saving if that is possible. Every effort must be kept up at least until the end of the next booming season, and this will require adequate labour and money. Extinction does not wait until Government has more finance.

The message 67 years ago

IN 1909 Mr E. Phillips Turner, then Chief Inspector of Scenic Reserves and later Director of Forestry (1928-31), in his annual report to Parliament commented as follows on damage to reserves by grazing:

"In nearly every reserve I inspected I found stock were in the habit of grazing . . . If our reserves are really to be preserved in their natural beauty, it will be necessary to prohibit the wholesale grazing of stock . . . Stock destroy the ferns, mosses, shrubs, and young trees and trample down the soft and spongy natural surface of the ground; drying winds sweep in and sooner or later the big trees themselves die or are blown down. Stock also are one of the chief factors that aid the spread of noxious weeds, for they carry many seeds in their dung and by trampling down the native

undergrowth make a suitable bed for the growth of wind-blown seeds and the seeds they deposit themselves. Fire will also spread in forests in which stock have grazed, as in such forests the undergrowth and trees are always parched and ready to fire from the merest spark. A forest in which the undergrowth has been destroyed loses its capacity for holding back the water from heavy rain; the effluent streams rapidly swell, inundate the lower lands, and then quickly dry up, causing great inconvenience by the shortage of water. In hilly country the destruction of the bush is generally followed by the surface soil slipping into the streams, leaving bare rock faces . . . Floods are now much more destructive than when the upper parts of the rivers and tributaries flowed from forest-clad lands."

Presentation of proceeds of Maud – Mangere Islands Appeal

AT two small functions in Parliament Buildings recently the President, Mr A. A. T. Ellis, presented the proceeds of the Maud-Mangere Islands Appeal to two Ministers of the Crown.

He handed a cheque for \$12,385.10 to the Minister of Internal Affairs, Mr A. Highet, for use by the Wildlife Service on the Mangere Island black robin project and another cheque, for \$11,385 to the Minister of Lands, Mr V. S. Young, towards the purchase of Maud Island, in Pelorus Sound, where three kakapo have been established in the new sanctuary. (A previous payment of \$1,000 was made to the Department of Lands and Survey as a deposit in the acquisition of the island.)

The money was the net proceeds received from the appeal to the end of July. However, further donations are still coming in. These will continue to be received, as it is intended to hand over an additional sum towards the end of the year.

Staff grateful

Speaking on behalf of the Wildlife Service, the Director, Dr Gordon Williams, said that he and the staff were most grateful to the Society for launching the appeal, and, in fact, for the sterling support given to the Service by the Society over many years. Dr Williams said the research team, under Mr Brian Bell, was shortly to leave for Little Mangere Island, and it was hoped that they would be able

to start the transfer of the black robins to Big Mangere, where the revegetation had made considerable progress.

Mr D. Mitchell, Director of National Parks and Reserves, represented the Department of Lands and Survey at the presentation of the Maud Island cheque.

Mr Highet and Mr Young, in accepting the cheques from Mr Ellis, both commented that it was most unusual for appeals to be launched to help Government, and expressed warm appreciation of the Society's magnificent gesture. Both wished also to offer sincere thanks to the many Society members and to the public who had contributed so generously.

Great asset

Mr Young commended the Society on its backing of the Department of Lands and Survey when the department wished to take advantage of the opportunity to purchase Maud Island as soon as it became available; it would be a great asset to the Wildlife Service in the years ahead.

He had been most impressed by the recent actions of the Waikato Branch that had resulted in the saving of part of beautiful Fitzgerald Glade, near Rotorua.

He said he was most appreciative of the appeal the branch had launched to raise some \$3,000 to assist the Department of Lands and Survey in its purchase and wished it well.



The President, Mr A. A. T. Ellis (right), handing over the cheque for the Wildlife Service to the Minister of Internal Affairs, Mr Highet.

New Zealand lizards

MOST people know that lizards occur in New Zealand, and many even recognise that two families (the geckos and the skinks) are present, but few are aware of the diversity of species which exists here. Geckos and skinks can be easily separated, but it is difficult to identify the different species, most of which are so poorly known they have no common names.

ALL New Zealand geckos have heavy, thick-set bodies covered with a loose skin of granular texture; a broad head separated from the body by a distinct neck; large prominent eyes with vertical slit pupils and immovable eyelids; and toes that are expanded into a lamellar pad to assist in climbing. In contrast the skinks have elongate, stream-lined bodies covered in tight overlapping scales like those of a fish; a tapered head with no obvious neck; eyes with round pupils and movable lids; long, slender toes.

Origins

Geckos and skinks are among the largest and most abundant of all lizard families and they are the only ones with world-wide distributions. Both families originated in the South-east Asian/Indonesian area and spread to occupy most parts of the world. As New Zealand has been isolated for about 80 million years, long before these lizards arose, they must have made their way here by sea — presumably by rafting. However, geckos and skinks are renowned for their ability to colonise remote islands and are the only lizards widely distributed in the Pacific; so it is not surprising that they reached New Zealand.

The three genera of geckos in New Zealand are found nowhere else and are very

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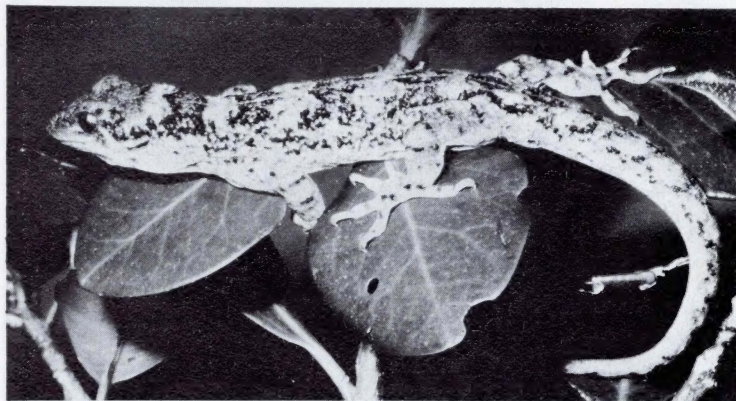
closely related to each other. They are unique in the family as the only species that give birth to their young rather than laying eggs. Similarities to the New Caledonian species suggest that the New Zealand geckos are derived from a single invasion from that island, probably during the Miocene period (7-26 million years ago), when most of the Malayo-Pacific animal species arrived in New Zealand.

Though all the species of skinks are endemic, the two genera currently recognised from New Zealand also occur elsewhere in Australasia. The species groups here suggest there have been two or three separate invasions, from the north and the west, and that skinks were well established by the Pleistocene (2 million years ago).

Speciation

Within New Zealand speciation has resulted, at the most, in only subtle differences in the morphology or variations in colour and colour pattern. Eleven geckos in three genera (*Hoplodactylus* 4 spp., *Heteropholis* 6 spp., *Nautilinus* 1 sp.) and 20 skinks in two genera (*Leiopisma* 19 spp., *Sphenomorphus* 1 sp.) are recognised at present. However, the taxonomy is outdated and many changes will be necessary.

The geckos can be divided into two natural groups. The first comprises all the species of *Hoplodactylus*, which are



Hoplodactylus duvauceli, New Zealand's largest lizard. This nocturnal gecko is now found only on islands in Cook Strait and off the north-eastern coast of the North Island.

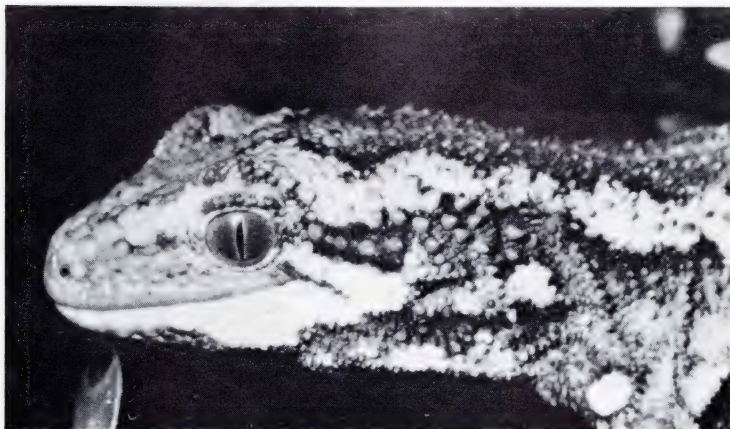
nocturnal and are coloured predominantly brown or grey; the inner portion of the toe is expanded into a broad pad. The second group contains all the species of *Heteropholis* and *Naultinus*, which are diurnal, are coloured predominantly green, and have slender tapering toes.

Similarly, the skinks can be divided into two distinct groups: those that are diurnal, with a long, slender body, long limbs, long toes, and a transparent disc in the centre of the lower eyelid, and those that are nocturnal, with heavy bodies, short limbs and toes, and a scaly lower eyelid. There are about 14 species in the former group (*Leiopisma*) and 6 in the latter (*Leiopisma* and *Sphenomorphus*).

The New Zealand lizards have been very conservative in their evolution and show none of the bizarre features that have arisen in lizards elsewhere. They range in size from the tiny skink *Leiopisma smithi*, at 12 cm adult total length, to *Leiopisma grande* or *Hoplodactylus duvauceli*, at about 28 cm adult total length.

Much of the speciation that has occurred in New Zealand lizards can be attributed to the isolating effects of the Pleistocene glaciations. When the ice last covered New Zealand, suitable lizard habitat would have been restricted to the northern part of the North Island and to coastal strips or pockets as far south as Stewart Island. The isolation favoured the formation of different species, well illustrated by the six species of *Heteropholis* recorded from the South Island.

As the ice retreated and the lizards rapidly expanded their ranges those with wide latitudinal distributions became



The rare *Heteropholis rudis* from North Canterbury. One of the diurnal, green geckos, it is known from fewer than 100 specimens.



The secretive *Leiopisma aeneum* is a tiny, nocturnal skink which inhabits heavily vegetated sites throughout the North Island.



Leiopisma lineocellatum is a diurnal skink with a beautiful green back. It occurs in open country from Hawke's Bay to South Canterbury, from sea level to above the bush line.

very variable (for example, *Leiopisma zelandicum* or *L. infrapunctatum*). One very interesting result of the Pleistocene glaciation is that all but one of the New Zealand lizards reproduce by giving birth rather than laying eggs. In cold climates lizards that give birth are more successful, because they can protect the embryo from extremes of temperature. The only exception, *Leiopisma suteri*, lives in the far north and is believed to be derived from a more recent invasion.

Distribution

Skinks and geckos occur throughout the North and South Islands and on Stewart Island, where they approach the southernmost limits for their families. Most of the inshore islands, including the Three Kings, have been colonised, but lizards have never been found on the Kermadecs or any sub-Antarctic islands. Only skinks are known from the Chatham group, but, surprisingly, not on Chatham Island itself.

On the main islands of New Zealand both skinks and geckos occur up to about 1700 m; so really only the high alpine areas lack lizards. As would be expected, fewer lizard species occur with increasing latitude or altitude, and the same four species (*Hoplodactylus pacificus*, *H. granulatus*, *Leiopisma lineocellatum*, and *L. zelandicum*) reach these limits.

The distribution patterns of individual species vary from widespread (some such as *H. pacificus* occur throughout the country) to restricted or relict populations. Examples of restricted distribution are shown by species confined to island groups, for example *Leiopisma fallai* on the Three

Kings, whereas relict patterns are illustrated by those species confined to islands in Cook Strait and off north-eastern New Zealand, for example, *H. duvauceli*.

Two factors have affected the overall distribution of lizards. The opening of the Cook Strait seaway about 15 000 years ago has limited the distribution of many species, though others are known from both the North and South Islands. At an earlier date the extensive seaway that crossed the central North Island is believed to have caused the distinct northern and southern groups of *Leiopisma* that now exist.

Habitat

Though New Zealand has wide extremes of temperature and rainfall, both geckos and skinks occur everywhere except the high alpine zone. Coastal habitats have the greatest range of species and the highest densities. At some sites, notably on small islands, as many as seven species occur at combined densities in excess of one per square metre. Many lizards may group together in the same retreat, and up to 40 geckos have been found under one stone.

It is difficult to assess the density of forest-dwelling lizards, though it appears inland forests have always had the poorest lizard fauna, usually no more than two to three species in any area. There are no strictly alpine species and those that occur in sub-alpine herb fields are also found down to sea level.

The *Hoplodactylus* geckos occupy a wide variety of habitats from the seashore to the mountain tops, including forest, but the *Nautilinus* and *Heteropholis* species are

arboreal and are found only in forest or scrub. The diurnal skinks are strictly confined to open, non-forested habitats, whereas the nocturnal species (North Island only) occur in damp, heavily vegetated sites.

Some species exploit a far wider variety of habitats than others do. The gecko *H. pacificus*, the most widespread of all New Zealand lizards, has been recorded from every habitat from the seashore to the mountain tops, except the very wet forests of Fiordland. In contrast the northern skink *L. suteri*, is known only from boulder beaches. Incidentally, it is the only nocturnal skink that lives away from vegetation.

Adult lizards have a well-defined home range which they get to know very well, and that of even the largest New Zealand species rarely exceeds 20 m across. Most species exhibit remarkable fidelity to their area over the years, and studies on *H. pacificus* have shown the same lizards in the same retreat after 9 years.

Food

All the New Zealand lizards are basically insectivorous, though they will take soft fruit or berries (for example, *Coprosma* and *Muehlenbeckia*). The diurnal geckos generally eat flies, beetles, and other insects, whereas the nocturnal ones eat mainly caterpillars, moths, and spiders. Some geckos also take nectar from flowers such as flax or pohutukawa. The skinks take a wide variety of invertebrates and some carrion; and on islands with nesting sea birds they eat regurgitated stomach oils or partly digested fish. *Leiopisma suteri* will enter rock pools in search of small crustaceans.

Reproduction

The sex of geckos and skinks can be determined easily. In male geckos there are paired swellings under the base of the tail which contain the hemipenes and just in front of the vent is a broad triangular area of pores. Female geckos lack both these features. The sexual differences in skinks are much more subtle, but a practised observer can sex them rapidly and accurately. Some skinks show sexual coloration in the breeding season, when the males may take on a reddish hue or flush to the body or belly.

The skink *L. suteri* is the only native New Zealand lizard to lay eggs (an Australian skink established in Auckland City is also oviparous), all the other species giving birth to live young. In the few species about which information is available mating takes place in spring, and the young are born from late summer to early winter. The gestation period for skinks is about 4 months, but for geckos it may be up to 6 months. Some geckos may mate in autumn after the young are born, sperm being stored over winter to fertilise eggs in spring. Geckos usually have only two young, but skinks may have up to 10. The egg-laying skink (*L. suteri*) mates in spring and lays its eggs in early summer in a short tunnel in damp soil or sand, usually under a stone. The eggs hatch 3 months later.

Most New Zealand lizards take about 2 years to mature and as adults may live for 10 to 12 years in the wild. Growth is very rapid in the first 2 years, but slows down considerably after the third or fourth year. All lizards regularly shed their skins; in

geckos it comes off completely like a sleeve, whereas in skinks it flakes off scale by scale. The skin is shed every 6 to 8 weeks in summer, when the lizards are active, but is never shed in winter.

Enemies

New Zealand lizards carry a number of internal and external parasites. The most conspicuous are the tiny, bright red skin mites which occur in great clusters round the eyes, ears, and legs of some geckos.

Though 14 different native birds have been recorded as eating lizards, only the kingfisher kills very many. Along the coast kingfishers dart down to catch basking skinks, and in forested areas they are adept at catching arboreal geckos. Tuataras readily take both geckos and skinks. Other native predators include the large ground beetle (carabid), which can take young lizards.

More serious than the indigenous predators have been the mammals introduced by man. Cats, mustelids, and rats are all predators of lizards, but rats have probably had the greatest effect. For example, off the northern coast of the North Island there are considerably fewer lizards and lizard species on islands with rats than on nearby islands without them.

Like many other kinds of lizards, the skinks and geckos can lose their tails as a means of escaping a predator. The tail is severed from the body by a muscle contraction at a cleavage plane which lies within a vertebra rather than between two of them. The lizard soon grows a new tail, which is never as long as the original and differs somewhat in colour and colour pattern.

In addition the New Zealand green geckos have devel-

oped a further defence ploy which consists of raising the body on the front feet, puffing out the sides to look larger, and emitting a loud croaking call. The effect is startling when coupled with a flash of colour from the brilliant blue interior of the mouth. Both tail-shedding and calling occur more readily at low temperatures, presumably because at such a time the animal cannot escape rapidly and has to rely on defence.

However, it is the destruction of natural habitat which is the greatest threat of all. Coastal and high altitude sites are fairly safe, but in the formerly forested lowland areas the changes have been profound. Selective logging of forest has little effect, but the creation and improvement of farm land virtually eliminate the lizard fauna. A few species which prefer open habitats (for example, *L. zelandicum*) have expanded their range inland to occupy land cleared for farming, though lack of cover in such habitats greatly restricts numbers of lizards.

Further reading

More information on New Zealand lizards can be obtained from the following sources:

- Bull, P. C., and Whitaker, A. H. 1975: The amphibians, reptiles, birds and mammals. In "Biogeography and Ecology in New Zealand", pp. 251-276, G. Kuschel (Ed.). Dr W. Junk, The Hague.
- McCann, C. 1955: The lizards of New Zealand. *Dominion Museum Bulletin* 17: 1-127.
- Robb, J. 1973: Reptiles and amphibians. In "The Natural History of New Zealand", pp. 285-303, G. R. Williams (Ed.). Reed, Wellington.
- Robb, J. 1975: New Zealand lizards. Part 1. *N.Z. Nature Heritage*: 649-656. Part 2. *N.Z. Nature Heritage*: 681-689.
- Sharell, R. 1975: "Tuatara, Lizards and Frogs of New Zealand". Collins, Auckland.

Waikato Branch's displays attract much public attention

THREE major events in the recent activities of the Waikato Branch have been the annual Arbor Day native plant sale, the display at the Waikato Winter Show, and the unveiling of the Athol Caldwell Memorial in the Walter Scott Reserve.

Arbor Day plant sale

The Arbor Day native plant sale made a profit of \$540 for the branch this year. The sale, which has become an annual event, is held in the centre of Hamilton and is now a recognised source of native plants.

Members grow plants in polythene pots for up to 2 years to establish well-rooted specimens. On the day of the

sale they are assisted by a local firm that lends and erects a tent and a nurseryman who provides back-up plants in case home-grown supplies run out, to add variety, and to provide larger plants of the popular lines such as kauri and rimu.

Winter Show

The Waikato Winter Show attracts thousands of people and is an excellent venue for advertising the Society.

The standard of the Waikato Branch display, which is manned throughout the 9 days by members, has won the goodwill of the Winter Show committee, and the Society is given this valuable space free of charge. This has also be-

come an annual activity and one at which new members are enrolled.

Caldwell Memorial

The Athol Caldwell Memorial plaque was unveiled by Mrs Adelaide Caldwell, wife of the late Mr Caldwell, and the chairman of the branch, Mrs Audrey Eagle, at a ceremony in the Walter Scott Reserve.

The plaque, which is situated in the newly planted Athol Caldwell Memorial Rimu Grove, is a tribute to this foundation member of the branch who worked untiringly to instil an appreciation of New Zealand plants in many people.



Left, upper: The Arbor Day native plant stall. N. McAdam photo. Left, lower: The branch's display at the Waikato Winter Show. N. McAdam photo. Above: Audrey Eagle (left) and Adelaide Caldwell at the unveiling of the Athol Caldwell Rimu Grove Memorial plaque. N. Every photo.

Rare and endangered New Zealand birds

ENDANGERED birds in New Zealand present a continuing problem of conservation that demands much effort and provision of adequate funds. The work that had been done to save dwindling numbers of some indigenous species was reviewed by B. A. Ellis in a paper he presented in 1974 to the Sixteenth International Council for Bird Preservation World Conference in Canberra. Because the situation he described then is still critical today the paper has been revised to bring it up to date and it is reprinted below.

THE Red Data Book lists 32 species and subspecies of birds from New Zealand and its outlying islands — a greater number than that of any other comparable region and almost 10 percent of the total world list.

New Zealand's avian fauna had developed in a very long period of geographical isolation, in a temperate climate, with a complete absence of land mammals except bats. In consequence very vulnerable ecosystems lay open to the arrival of European settlers in the early nineteenth century. With man came sheep and cattle, pigs, and goats; deer and rabbits were liberated widely, and 28 species of birds were introduced. Cats spread from the settlements and mustelids were liberated when rabbit populations got out of control.

Invasion of rats

Most sinister of all, rats soon covered the whole country. New Zealand now has three species of rat. The Polynesian rat or kiore (*Rattus exulans*) is considered to have been brought by the Great Fleet of the Maoris about 1350 A.D. Once widespread, it retreated before the other two species and is now confined to some off-shore islands and a remnant population in

Fiordland. Largely terrestrial, it is consequently less of a threat to birds than the arboreal *Rattus rattus*, but it is a serious predator of many burrowing petrels. The Norway rat is also widespread.

We cannot assess what depredations were made by introduced diseases, but I believe that some large-scale reductions in the numbers of certain endemic species are likely to have been the result of first contact with virulent diseases carried by introduced species or farmyard poultry.

About 70 percent of the country was under forest 170 years ago; now only 23 percent is forested, a smaller percentage than in Japan (64 percent), West Germany (29 percent), and other countries where changes from the primeval state have been made gradually over many centuries. The first point is that there is now a small amount of forest (and this is not supported to any degree by hedgerows or farm "woodlots" of indigenous trees). The second point is that this rapid decline provided little chance for adaptation, which might have helped the birds survive. Those birds not dependent on forest had to contend with burning of scrub and native grasslands, followed by the grazing and trampling of hoofed animals on land which

had never experienced either. The New Zealand quail, which had inhabited the Canterbury grasslands in great numbers, was extinct by 1870 — 30 years after settlement.

If we accept that each species fills a definite ecological niche to which it is confined, we cannot ignore the effect of the many non-predatory birds which were introduced into the New Zealand biota. The competitive effects of these have often been exaggerated; it is certain that they did have, and continue to have, some influence on the survival of indigenous species.

The impact of settlement, the invasion of alien mammals, and more recently the accelerating pace of so-called technological progress have therefore had a profound influence on the indigenous fauna, and this soon became obvious to even the most land-hungry settler. It is not surprising that there soon arose a growing desire to conserve endangered species.

Pioneer

Happily, New Zealand was a pioneer with legislation for the conservation of wildlife; as early as 1864 closed seasons were declared on native pigeons and ducks. In 1896 an Act of Parliament protected kiwis and kakapo. Two years earlier the Government had employed Mr Richard Henry to transfer kakapos to island sanctuaries to preserve them from the rapid decline observed in the South Island.

In 1923 the New Zealand Native Bird Protection Society was formed by persons actuated by the sincere belief that

unless steps were taken to preserve them, many of New Zealand's unique bird species were doomed to extinction. The objects of the Society were to obtain the efficient protection and preservation of New Zealand's native birds and unity of control of all wildlife.

Nine years later the name was changed to the Forest and Bird Protection Society of New Zealand in acknowledgment of the fact that, in the long term, conservation of their habitats is the only effective way to preserve the birds. For this reason over the years the Society has made repeated submissions on the threat to New Zealand's forests by the continued presence of noxious animals; has contributed towards and advocated the acquisition of certain important off-shore islands; has petitioned Parliament on threats to the indigenous flora and fauna of Coppermine Island posed by copper prospecting; has itself acquired, by gift and purchase, reserves for the preservation of indigenous forest habitat; and for many years has strongly supported the preservation and protection of New Zealand's national parks, scenic reserves, flora and fauna reserves, and wildlife sanctuaries and refuges. It has concerned itself also with the proposed utilisation of South Island beech forests and the sad state of the much-depleted habitat and avifauna of the Chatham Islands.

The present membership of the Society is some 22 000 persons, and even with the recent upsurge in public interest in conservation, the Society's established place gives it a leadership over all other organisations and a significant position in the formation of public opinion. Education of the young has always

been given special attention, and the quarterly journal has a wide distribution and the potential to stimulate interest, impart knowledge, and solicit information about threatened wildlife from citizens and organisations throughout the country.

Rat control

The Society and the Wildlife Service collaborated closely in efforts to control the *Rattus rattus* population, which in 1964 destroyed so much of the unique birdlife of certain of the Muttonbird Islands, off the south-west coast of Stewart Island. The successful efforts of a small number of men from the Wildlife Service in saving the South Island saddleback from almost certain extinction have received world-wide recognition and a special page in the Red Data Book.

The most probable explanation for the appearance of the ship rat on the islands of Big South Cape, Solomon, and Pukeweka in 1964 was the frequency of visits of fishing boats during the crayfish boom of that time. Rats appeared simultaneously on all three islands and when the muttonbirders arrived for the season's activities they found all 35 dwellings severely damaged by rats.

The effect on the island's wildlife could be seen to be very serious and immediate steps were taken by the Wildlife Service to salvage what could be saved in a desperate situation. The islands comprised the last natural habitat of the South Island saddleback (*Philesturnus carunculatus carunculatus*), Stead's wren (*Xenicus longipes variabilis*), and the Stewart Island snipe (*Coenocorypha aucklandica iredalei*). Other species affected were the Stewart

Island robin, the fernbird, the banded rail, and also the rare short-tailed bat. All birds on the islands have been affected, but all the foregoing and the bat have disappeared to the best of our knowledge.

Transferred

Before stocks of saddleback and wren were entirely lost birds were transferred to nearby Big Island (31 saddlebacks) and Kaimohu (27 saddlebacks and 6 wrens). The saddlebacks have thrived on these and other rat-free islands to which they have since been transferred, but it is not known if the very small number of wrens transferred have become established to save the subspecies from extinction. [Recent visits to Kaimohu by the Wildlife Service have revealed that the transferred wrens have not survived.]

Simultaneously with the capture of birds for transfer by officers of the Wildlife Service, members of the Southland Branch of the Society, with the approval and support of the muttonbirders of Solomon Island, applied 270 kg of warfarin poison on treated oats in an effort to reduce rat numbers and reduce risk of further spread of the menace until transfers of birds or other possible action could afford the endangered species some hope of survival. This occupied four men for 8 days — building 125 boxes, placing them over the island (some 16 hectares), and distributing and replenishing poison.

Some dozens of saddlebacks were still present at this time, and although it was known that heavy rat populations were present, especially around buildings, it was not considered for various good reasons that limit populations had been reached. The wrens

had already all succumbed on Solomon, as had robins and fernbirds.

Poisoning successful

Eight months later, when a team of naturalists led by the Wildlife Service assessed the whole situation on the islands, the initial poisoning was proved to have been successful. Rat numbers were low and there had been a spectacular recovery in the vegetation. It was therefore decided, with the assistance of the muttonbirders, who were obviously also interested in keeping rats low in number, to continue poisoning on Solomon on an annual basis and to investigate immediately the prospects of a co-operative effort on Big South Cape Island. Big South Cape (850 hectares), however, presented a mammoth task compared with the effort on Solomon. On the initiative of the Society, muttonbirders on Big South Cape were approached and the Big South Cape Rat Control Committee was set up, comprising Forest and Bird Society Executive members and representatives of the Cape muttonbirders. The Society agreed to provide all technical know-how and to organise materials and mix poison, and the muttonbirders were to finance the scheme; 1250 boxes, which only rats could enter, were made of durable material and transferred to and distributed on South Cape.

At this point the Wildlife Service was approached and they agreed to contribute \$200 per year towards the cost for 5 years. Since the expiration of that period the job has been carried on, without any Government financial backing, entirely by muttonbirders and the Society. Over the 12 years involved, poison distribution has varied between $1\frac{1}{2}$ and 3

tons per season, and this has maintained rat populations at a very low level.

It will be carried on in the future, as it represents the best co-operative effort possible to meet the objectives of the Society to assist in maintaining low rat numbers. The work gives the opportunities for contact with people using the area and promotes a better understanding of the values involved and of the general fragility of ecosystems in the area. It meets the wishes of the muttonbirders to honour their obligations in regard to vermin control under the Land Act and of course the general desirability of maintaining freedom from the damage and nuisance of large rat populations.

The Society has continued an intensive poisoning effort on Solomon Island with a view to achieving the lowest possible level of rat population. It is considered that this can be done by careful coverage

of the island immediately before the return of the petrels, mainly sooty shearwater (*Puffinus griseus*), and so to strike the rats at their lowest ebb before the stimulus of the petrel reoccupation takes effect. In a few years all the available small islands free of rats



Wildlife Service photo by
J. L. Kendrick
A juvenile saddleback.



Wildlife Service photo by D. V. Merton
A Stewart Island snipe on Big South Cape Island.

should be populated by transferred South Island saddlebacks, and there may be an opportunity, after appropriate assessment, to re-establish the saddleback on Solomon.

Capacity to adapt

The future of many species of endemic birds will depend to some extent on their capacity to adapt, and this concept of reintroduction, though it will involve the liability of continued regular applications of warfarin in a remote area,

offers a rare opportunity to increase available habitat and to observe the threshold of a prey species's tolerance of alien predators. It is hoped that some research may also be done on aspects of the recovery of ground litter insect populations or even the whole invertebrate fauna.

The South Island robin (*Petroica australis australis*), which has been so vulnerable to rat presence on islands, has already proved its ability to survive on the mainland, and

it would seem that the South Island saddleback's evolutionary background should make it a good prospect also. Success with warfarin in rat control elsewhere encourages us to hope that the reduction in level of rat population which can be reached in our circumstances will also be low enough for the survival of some of our fragile species in an island habitat.

When the Society was founded in 1923 there was no Government department specifically responsible for wildlife, and the Society worked to bring about the formation in 1945 of what is now the Wildlife Service of the Department of Internal Affairs.

GIFT MEMBERSHIPS

We welcome new members. Why not give a gift membership for Christmas or a birthday? Just complete this coupon and mail it with your cheque to:

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Co-ordinated programme

The Wildlife Service has enabled the formation of a centrally co-ordinated programme, giving the ability to consider priorities and to plan the use of limited resources. And they have been very limited, with resultant limitation of certain urgent projects. We believe that most New Zealanders consider that our native birds have a special place in our national inheritance, but to depict them on postage stamps, coins, and bank notes is less than sincere when each citizen is asked to contribute a few cents a year to conservation measures.

A more generous allocation of resources is essential to achieve all the work that must be done **now**; environmental factors will not wait for administrative postponements. This generation has the advantage of an understanding of many of the problems; we must face our responsibilities and accept nothing short of the proper solutions.

Single policy adopted for Okarito and Waikukupa State Forests

AT its half-yearly meeting in June the Council decided that the Executive should review the policies of the Society relating to Okarito State Forest and Waikukupa State Forest, which had been issued respectively on 17 March and 24 May.

THE Executive at its meeting on 7 July considered that the policies should be combined and that, with due consideration to the future utilisation of Westland indigenous forests, full protection should be afforded to south Okarito and the whole of Waikukupa State Forest.

The Society is cognisant of the strongly voiced public objections to the logging of this part and the possibility that the Westland National Park Board will recommend that these areas should be reserved as an extension of that national park.

The Society had previously requested that a corridor cutting through the southern part of Okarito Forest should be reserved as a complete natural environment and suggested that this should run from Kohuamarua Bluff up to Lake Mapourika and thence to Franz Josef. After consideration and observation of the southern portion of the Okarito Forest, it is thought that the whole of it should be included in the Westland National Park and, further, that a wildlife management status should be established for the two coastal lagoons included—Three Mile and Five Mile.

Buffer zone

The Executive decided that the following single policy should be adopted by the

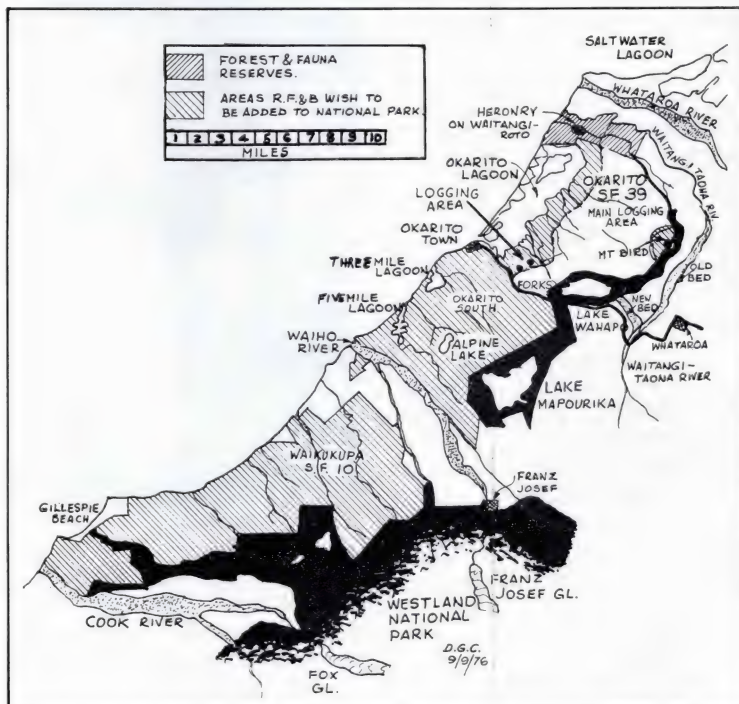
Society to replace the two separate statements issued previously:

1. That a 1-mile buffer zone be established round the complete eastern shores of Okarito Lagoon.
2. That only selective logging to maintain the forest in perpetuity be applied to the terrace forest behind this buffer zone (as shown in the accompanying map). Further, that the moraine arcs and the area they encompass, including Mt Bird, be added to Westland National Park.

3. That the whole of southern part of Okarito State Forest, that is, to the south of the Forks-Okarito road, be added to Westland National Park and that the two coastal lagoons—Three Mile and Five Mile—should be afforded wildlife management status. The catchment of Alpine Lake should be protected under all circumstances.

National park status

4. That Waikukupa State Forest in its entirety be added to the Westland National Park. The socio-economic problems relating to employment in the Westland forestry industry, coupled with



Okarito and Waikukupa State Forests, showing the areas the Society wants added to Westland National Park.

long-term contracts for the supply of indigenous timber, may militate against the inclusion of the forest as a whole into Westland National Park, and it is understood that an area adjacent to Gillespies Beach is viewed as a future logging possibility. The Society is aware that decisions on the future of Waikukupa Forest are imminent and enjoins the authorities concerned to afford the whole forest national park status.

5. That the outlier of Waikukupa State Forest adjacent to the south bank of the

Waiho River mouth be afforded the full protection of adequate forest buffer zones to be retained in perpetuity, notwithstanding logging behind them carried out by the Department of Lands and Survey and proposed by the Forest Service.

6. The Society is concerned that no apparent progress in bridging into northern Okarito has taken place. It considers that the early provision of the bridge would have avoided all the public outcry and legal action which have been occasioned by logging action

between Okarito River and the Forks-Okarito road.

7. Implicit in this policy is the recognised need to deal with existing logging concessions. It is understood that, apart from what is mentioned above, no parts of south Okarito or Waikukupa are required to meet existing logging commitments.

Appeal to extend Fitzgerald Glade

VIGILANCE of the Waikato Branch has saved a 6-acre area of native bush adjoining the beautiful Fitzgerald Glade, a well-known reserve on the Rotorua-Tirau-Auckland highway.

The farmer-owner was about to fell the trees, but prompt action resulted in his stopping the work while the possibility of saving the 6 acres of bush was investigated.

The upshot was that the Department of Lands and Survey agreed to buy the area, and the Waikato Branch promised to launch an appeal to raise some \$3,000 towards the cost.

The branch has the full backing of the Matamata County Council and the Commissioner of Crown Lands.

As soon as the appeal was launched Winstone Ltd. agreed to underwrite the full amount, a splendid gesture.

Donations to the appeal may be sent direct to the Waikato Branch, Royal Forest and Bird Protection Society, P.O. Box 9365, Hamilton, or may be paid in at any branch of the Waikato Savings Bank.

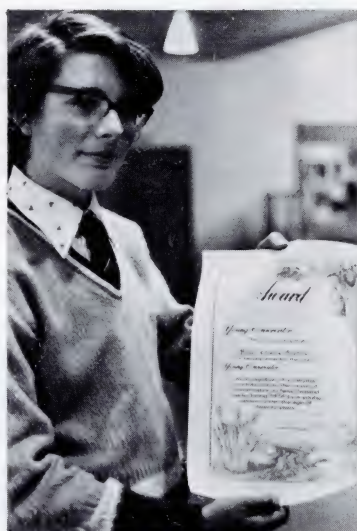
Society member awarded title of Young Conservator

THE Society congratulates Allan Graeme Bremner, of Dunedin, who has been awarded the title of Young Conservator by the National Conservation Council for his work in chemically processing the fibres of gorse, twigs, and thorns to make good white paper. Also considered in the award was the interest Graeme has taken in problems of pollution.

Graeme, who is a pupil of King's High School, Dunedin, is a member of the school's group in the Society. He was presented with his citation by Mr Adrian Chisholm (who was himself National Young Conservator about 3 years ago) at the opening meeting of Conservation Week on 2 August.

The citation reads:

"This is to certify that Allan Graeme Bremner is hereby



Allan Bremner.

awarded the title of Young Conservator in recognition of a valuable contribution to the cause of conservation in New Zealand made during 1976 by a young person under the age of 20 years."

Conservation report

THE past 3 months have, as usual, been busy for me, and as they are the culmination of 17 months' work since my appointment to the Society, I shall include in this report the present situation of some of the major projects we have handled during the whole period.

Conservation has its disappointments as well as its successes. So much change to our ecology and our environment goes on in New Zealand that it behoves us to stop and consider. Most of us have our small horizon; it may be up to that road end, that street over there, or to those nearby hills.

Our concerns relate to our immediate surroundings. But every one of our 3 million population has his own local view — 3 million views! But what draws them all together so that we can have an overview of what is really happening to our country? I suggest that the Society, with its 22 000 members and its 32 branches and sections throughout the country, imbued with protection and conservation, produces such an overview of New Zealand's changing scene — the endless nibbling at our old natural scene.

My job is at the centre of all this, and I can discern the changes taking place as consequence of all the information feeding in from branches and of all the exposure I get going to the areas at risk — swamps, estuaries, forests, birds, the land, the industrial changes, energy supply, pollution, and noxious animals.

The ecology of New Zealand is not a simple thing; the

**By D. G. Collingwood,
National
Conservation Officer**

inter-relation of our soil, water, steep mountains, urban spread, and industrial development is something sensitive that is not recognised by everyone, hence the threats to our ecology. Our job and my job are to be concerned with change to ensure that modifications proposed are not inimical to the future maintenance of our ecology.

Ahuriri Estuary

In 1975 the Society involved itself in the demand that the Ahuriri Estuary, Napier, should become a national water conservation wildlife and recreational reserve. The result has been a recognition by Government and local body alike that something has to be done to secure this unique estuary for posterity.

Committees imbued with the desire to protect as opposed to destroying have come into being, and the matter is still being discussed — a success!

Maui pipeline

Though the Society had some success in protecting the forest and features of the Whitecliffs area, north of New Plymouth, we have not been able to alter the route of the Maui pipeline in the Hakarimata Ranges near Huntly.

Head office and the Waikato Branch earnestly requested that the route should avoid cutting over the bushed Hakarimata Ranges and

instead should proceed along the flat banks of the Waikato through farm land. Notwithstanding the fact that farm land of 100 years can heal in 2 years, compared with bush which has stood for thousands of years and which takes hundreds of years to heal, Cabinet has agreed with the short-term interests of farmers that the farm lands should be protected, and a scar over the Hakarimata Ranges is to be legated to the future — a disappointment!

Hemi Matenga

This extensive bush reserve runs along the seaward face of the range backing Waikanae on the western coast north of Wellington. Farmers were allowing stock to roam up its steep scree slopes, and reserve boundaries were being ignored.

At the request of the Department of Lands and Survey I conducted a thorough survey with their Wellington rangers. It was clear that the reserve had suffered, and the inspection proved the historic nature and uniqueness of the bushed reserve, facing into the westerly winds from the Tasman Sea.

It was advised that new stock fencing should be introduced to allow a 7-m regenerating strip from the true forest edge to be maintained by the Kapiti Branch of the Society; further, that clear delineation of its mountainous northern and top edge should be laid down and that the encroachment of urban spread should be stopped. The forest cover is active and will prove a boon to future generations in this fast-growing area.

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Gateway to Fiordland National Park

TE ANA-AU CAVES



Te Anau is the Gateway to 3,000,000 acres of Fiordland National Park Sanctuary for all bird life, it was here that the supposed extinct notornis was found. Steeped in Maori History and legend the area is magnificent with soaring mountains, untouched bush, waterfalls, underground rivers and glow wormcaves.

LAKE MANAPOURI



This lake is the most beautiful in New Zealand.
After arrival at West Arm, site of New Zealand's largest Hydro-electric Station, passengers are taken by coach down to the powerhouse.

DOUBTFUL SOUND



"This fortress built by nature for herself". Shakespeare could well have been visualising Doubtful Sound when he wrote these words. Great cataracting streams, sheer rocky faces, mountains & bush—all part of Fiordland at its natural best.

MILFORD SOUND



Milford Sound is breathtaking. Rudyard Kipling described it as 'the eighth wonder of the world.' This great sea-canyon is ten miles long and flanked by mountains rising up to 6,000 ft. A launch trip is essential to appreciate the beauty.



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Antarctic birds

With the United Nations Association I waited on the Minister of Foreign Affairs as an expert witness when the 200-mile limit and the Law of the Sea Conference were being discussed and made a point of the ornithology of the New Zealand Antarctic area.

It is clear that our protection of birds must extend to all areas under New Zealand's jurisdiction; we must be positive about areas beyond the Chathams and the Auckland Islands.

Penguins are being transferred to American research organisations from the Ross Sea Dependency, with scant heed to maintenance of healthy indigenous flocks in the area. That our Society is concerned was made abundantly clear, and the Canterbury Branch has undertaken to monitor the matter with the Antarctic Studies Department of the University of Canterbury and report later.

Horohoro Forest

There has been much newspaper comment on the problem of the Horohoro Forest, eastern Mamaku Range. Lest it be thought that the Society had taken no action, I visited and inspected this forest with the Conservator of Forests, Rotorua, and members of the Waikato, Rotorua, and Tauranga Branches. After this, and before the spate of newspaper and radio statements, the Society wrote to the Ministers of Forests and Railways, calling for the immediate closure of the Railways Mamaku mill as the clearest way of preserving this forest home of the kokako, with its wonderful stands of podocarp.



D. G. Collingwood photo

An unusual ridge-top deer wallow in the Hemi Matenga Reserve.



S. Gray photo

The Waipari Valley in the Mamaku Range, which the Society wants to save.

The matter is under progress, and we remind the Ministers monthly of our call.

Pacific Cement

The Pacific Cement project would involve mining of limestone near Gladstone, Wairapa, and the transporting of it some 20 miles to Woodside for processing into cement. Woodside is a railway siding abutting the Waiohine entrance to the Tararua Forest Park; moreover, it is within

fall-out area of the fruit-growing and town district of Greytown.

I appeared at the hearings in my own right as an engineer and pointed out the pollution hazard to large areas from chimney emission of almost uncontrollable sulphur dioxide and the many features of concern in the design of the proposed plant. As the Society's conservation officer I drew attention to the damage to trees and the amenity of the adjacent State forest park.

CoEnCo

I attended the annual meeting of CoEnCo and was a speaker at the Energy Symposium in the evening. My subject was "The Sensible Alternatives to Nuclear Power" and I ranged over the worthwhile alternatives. My preference was the direct pyrolysis of purpose-grown trees, which I pointed out had at least 10 times the continuous potential of solar or wind power; moreover, purpose-planted trees sustainingly

CONSERVATION ASSISTANT

Applications are invited from men in their thirties for a position in the head office of the Royal Forest and Bird Protection Society involving publicity and assisting the National Conservation Officer and the Secretary.

Qualifications required: Dedicated application to the objects of the Society and a willingness to carry out a wide range of duties.

Suitable applicant could eventually progress to either Secretary or Conservation Officer.

Ability to speak in public an advantage.

Salary negotiable and, according to age and qualification, in the range of \$5,500 to \$7,000.

Successful applicant would be expected to begin on 25 January 1977 and to reside in Wellington.

Written applications, which close on 26 November 1976, should be addressed to: The Secretary, P.O. Box 631, Wellington.

All applications will be treated in the utmost confidence.

cropped could supply energy only 10 percent below that of Maui gas. I reiterated the Forest and Bird policy (see my notes in the August issue) and left the listeners with the prompting thought that something significant must be done instead of dreaming of solutions which involve just solar or wind generation; of themselves these cannot provide sufficient power as an alternative to nuclear power.

Okarito and Waikukupa

In late August I revisited for several days the Okarito and Waikukupa State Forests in south Westland and thoroughly inspected the logging areas and the forests. This reinvestigation filled the gaps in our knowledge, and the further information gained is available for the litigation we are undertaking to protect the area. As a consequence our final policy (see page 17) was promulgated.

We are concerned at the threats of industry where mining interests conflict with national park laws. Radio and television appearances of the Minister and others cause us concern that laws may be changed to ease the restrictions on mining. There is going to be much opposition from the Society if the national park laws are threatened with change. The national parks, including the State forest parks, are part of New Zealand's heritage and must be protected.

Waipari Basin

This valley, parallel to State Highway 5 through the Mamakus, should be protected and made part of the Kaimai-Mamaku State Forest Park. It has been leased by the Forest Service to N.Z. Forest Prod-

ucts for felling, and access roads have been put into the area. The Waikato Branch is most opposed to felling of trees in this valley, and I have visited it repeatedly with them as the threat mounts. In our view water and soil conservation guidelines have been ignored, and increasing erosion is occurring, to the future detriment of the Hauraki Plains.

Conservation authorities and local bodies have become concerned as the situation has been drawn to their attention. The valley is part of the water catchment; a succession of rimu, tawa, and tanekaha is growing apace and varies from young trees to forest giants; and silt is blocking creeks already. The Society is earnestly trying to prevent further depredations in the area and to put a stop to any logging and is also calling for the area to be a scenic reserve.

Branch visits

Since my last report in the August issue I have visited and addressed the Manawatu, Rotorua, Tauranga, Waikato, and Hastings-Havelock North Branches. I have inspected the Ministry of Works and Development's national plant laboratory in Palmerston North and the Forest Research Institute in Rotorua. With Dr Lambrechtsen in attendance I have presented to the Parliamentary Select Committee our Society's submission opposing the petition on the thar (see page 25).

There are only three branches and sections out of the 32 that I have not visited during my 17 months of service to the Society. The work has been onerous, but most satisfying. After all, as I go round I realise that I am meeting some of the very best people in New Zealand!

Life cycle of red admiral butterfly an absorbing study

NATIVE red admiral butterflies (*Vanessa gonerilla*) abound in New Zealand and have an absorbing life cycle for study.

THE minute eggs are laid on native nettle bushes or on the annual variety of nettles, and a careful look at the very tips of the bristle-like hairs will reveal them. Within the tiny space of each egg is the beginning of a wonderful life cycle.

After about 12 days a minute caterpillar emerges and crawls about apparently unharmed by the stinging hairs; after a day or two it settles down to making a tent by spinning strands of silk. As the caterpillar moults and grows, its tent making becomes very efficient. Sometimes two nettle leaves are used in the larger tents. These leaf tents are for the caterpillar to hide in during daylight.

Greedy creatures

Caterpillars are greedy creatures. They don't just eat to live; they live to eat, almost defoliating the nettle bushes. After eating and moulting several times each caterpillar prepares for the chrysalis stage, finds a suitable place—usually on the underside of a leaf or a stalk or branch—and begins to spin a small mat of silk. It then turns round and inserts the hind pair of claspers into the mat of silk, dangles head downwards, and hangs in this position for about 12 hours while marvelous changes are taking place.

Finally, it drops its head, then, as if by magic, its skin suddenly splits up the back, disclosing the immature

chrysalis. The skin soon wrinkles upwards, and within a few hours the newly formed chrysalis hardens and perhaps changes colour.



Above: As the butterfly emerges, so the chrysalis shell opens up.

Above right: The butterfly is now clear of the chrysalis shell, wings gently unfolding.

Right: Wings fully extended, the butterfly hangs in this position for about 2 hours while its wings harden for flight.

By Elma M. Cook

The chrysalis stage lasts from 14 to 21 days, depending on climatic conditions. Before emergence the chrysalis



shell is very thin, and the shape and colour of the butterfly become clearly visible.

Wings unfold

Sometimes the eye of the butterfly peeps out first, or the chrysalis shell simply splits open and out pops the butterfly. Within a second or two, as the butterfly emerges, the wings gently unfold; this unfolding occurs as blood pulsates into the veins in the wing structure.

The newly emerged butterfly clings to the empty chrysalis shell and settles down for an hour or two while its wings harden for flight.

The brownish tones on the wings are splendid, but when the butterfly opens its wings before take-off, the colour and texture of them are magnificent.

Old members greatly valued

FOLLOWING is an extract from a letter received from one of our very early members, who joined just a year after the Society was founded.

Older members, many of whom Mr Nelson, former President, knew personally, are greatly valued. At head office the endeavour is to keep his personal interest in people alive.

"I have been a member since 1924 after seeing an 'Ad' on the screen of the Octagon Theatre in Dunedin. The great event of my life was when I rode the Haast in 1926, and slept in the Clarke and Burke Huts, and stayed at the Cron homestead, to come back thru' thick snow on the beech forest, a wonderful sight. More Power to the work!"

(signed) (Mrs) Hazel Shaw
(nee Bentham)

Notify changes of address

The Post Office has returned a large number of copies of the August issue of *Forest and Bird* marked "Gone—No Address".

Please notify the National Secretary, P.O. Box 631, Wellington, if you have changed your address or intend to do so.

Set an example

MEMBERS of the Society should always be prepared to set an example to others by not creating any litter and by even removing other people's trash.

If you light a fire in the bush, see that it is well doused before you leave it and try to leave your stopping place tidier than it was before your arrival. Most forest fires are caused by carelessness.

AN IDEAL CHRISTMAS GIFT

An ideal Christmas or other gift—

"AN ALBUM OF NEW ZEALAND BIRDS" (Lily Daff).

This handsome volume, containing 50 colour plates, has received wide acclaim from reviewers. Some of the comments are:

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"A most gifted artist".

"An excellent reference book for every home".

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Order form—

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Please post mecopy/copies of "An Album of
New Zealand Birds".

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Address:

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(Cheque for \$5.00 enclosed. Price includes postage and packing.)

Society opposes Deerstalkers' petition about thar

MEMBERS will have noted the recent efforts of the Society in pressing for stronger control of thar on the high mountain lands of the South Island. A further move was made last month, when the Society opposed the petition of the Deerstalkers Association to Parliament by presenting the following submission to the Land and Agriculture Select Committee. The submission is published below in full.

THE Royal Forest and Bird Protection Society of New Zealand Incorporated thanks the Select Committee for this opportunity of commenting on the petition on thar.

The Royal Forest and Bird Protection Society of New Zealand Incorporated has twenty-two thousand members spread through thirty-two Branches and Sections throughout New Zealand. Since 1923, when it was formed, it has represented its views in successive legislation relating to noxious animal control.

The thar is a Himalayan mountain goat with its type locality in the Gemla Hills, Nepal. It was introduced to New Zealand in 1904 and 1909 in the Mt Cook region. By 1970 it had spread over 3600 km² and was spreading at a rate of 3-5 km per year, faster in a northerly than a southerly direction. This rate of spread is extremely fast and exceeded only by feral horses, chamois, and grey kangaroos.

In 1964 thar covered an area from the headwaters of the Waimakariri River to the Landsborough River in south Westland and since then it has spread towards the Tasman Sea coast and is on the ranges behind Harihari. In 1970 it was postulated that it might spread to the Spencer Moun-

tains, the north-west Nelson region, the Kaikoura Range in the north of the South Island, and to the high country between Lakes Wanaka, Wakatipu, and Te Anau in the south.

To prevent this from happening it was considered that the spread would have to be checked by reducing thar numbers annually by at least 20 percent to outweigh the annual increment. Hindsight indicates that reduction of thar numbers is not carried out successfully by private hunters. Forest Service hunters on foot and in helicopters have proved to be the main influence in controlling the spread of thar.

Snow tussock grasslands are the main thar habitat, including *Chionochloa flavescens*, *C. pallens*, and *C. rigida*, the most important food of the thar; it is very dense where thar are absent (the Fox Valley); it is scattered and uncommon where thar are numerous (the Douglas Valley, south Westland). Areas depleted by thar are dominated by *Poa colensoi*, and characterised by numerous dead and rotting stumps of snow tussock; reduction of snow tussock affects the thar's plane of nutrition in late winter, which is proved by a steep decline in its fat resources at that time.

Extreme local damage to alpine grasslands was always encountered when thar were seen in mobs of more than three or four. The animals "camp" on one small area, typically of a radius of 10 m or so, and within it graze palatable species towards extinction while leaving surrounding grassland apparently untouched.

Lest it be thought that the spread of the thar since 1904 is no problem, from 1960 to 1965 New Zealand Forest Service hunters killed 8327 thar; from 1962 to 1965 private hunters, on the other hand, killed 1987 thar. From the control figures established over the years it was estimated in 1974 that some 44 000 thar existed, and it was stated then that while these animals covered 3600 km², it is clear from the deterioration of the vegetation in Class VII and Class VIII country that these numbers are still too high.

In respect of the petition, while the New Zealand Deerstalkers Association petition prays for the retention of thar as a game animal, it should be pointed out that:

1. The thar is not a game animal, but a noxious animal as described in the Noxious Animals Act 1956.
2. The thar is not a rare animal. The genus *Hemitragus* has three subspecies — *H. gemlahicus* (the Himalayan thar as introduced to New Zealand), *H. jakari* (the Arabian thar), and *H. hylocrius* (Nilgiri thar). Furthermore, Himalayan thar are held in Woburn, England,

and graze on the Table Mountain, South Africa, having escaped from a Pretoria zoo; it may be shot in Argentina and, we are informed, also in Minnesota U.S.A.

3. Thar will continue to pose a threat to vegetation and water and soil values by browsing and trampling as long as it occupies Class VII and Class VIII land, which is extremely slow to revegetate because of very severe environmental factors. Where damage to vegetation has taken place the slow recovery after diminishing or removing the thar population should not be interpreted to mean that the vegetation has recovered to a degree that water and soil values are no longer threatened. Though the vegetation may be in the process of recovery, it is claimed by this Society that water and soil values are still threatened.
4. Because of the gregarious habits of thar and other goat-like animals, its control is not as expensive to the taxpayer as the control of many other noxious animals.
5. Though thar may be more accessible in New Zealand than in its native country, this does not justify its retention in numbers which threaten vegetation, water flow and yield, and soil stability in this country.

For the above reasons the Royal Forest and Bird Protection Society of New Zealand Incorporated **recommends that**

- (a) Thar be maintained in the Noxious Animals Act 1956 as a noxious animal (see Noxious Animal Control 1965 Recommendation (a) (3)).

- (b) Class VII and Class VIII land be excluded from any lease or licence which permits tourist safari hunting on occupied lands of all tenure (Noxious Animal Control and Related Matters 1974 Recommendation D 18) .

- (c) The New Zealand Forest Service retain and exercise its right under the Noxious Animals Act to enter on to any land for the purpose of control of noxious animals (Noxious Animal Control and Related Matters 1974 Recommendation D 19) .

- (d) The spread of thar be prevented by a vigorous extermination policy in recently colonised mountain country.

- (e) Thar populations be reduced in all other mountain country to levels not threatening vegetation, water, and soil values as determined by both the New Zealand Forest Service and the local Catchment Authority.

Finally, the Royal Forest and Bird Protection Society of New Zealand Incorporated **reiterates:**

- (f) That even a few thar present a formidable threat to the rare native plant life that has developed on high lands in the absence of any browsing animals, even the moas in the past. The massive depletion of these plants by the agency of the thar has removed the binding vegetation that keeps the rocks and soil stable in our high lands. The damage to the watersheds and the increasing choking of rivers, and erosion and destruction of lands far from the mountain tops,

are an accelerating process and will be a problem for years to come. It has assumed disaster proportions already in some catchments. It is quite insufferable that calls for protection of an animal continue year after year from heedless interests who have pecuniary profit and enjoyment as their main aim when the country is put at risk.

[It is pleasing to note that an excellent article was published in *Soil and Water* for August 1975, in which the National Soil and Water Conservation Organisation repeats with great emphasis what the Society has been saying for over 40 years.

The opening paragraph of the article says:

“While noxious animals are permitted to graze on severely eroded high country land, vital water and soil conservation activities essential to the New Zealand economy are threatened”, the chairman of the National Water and Soil Conservation Authority, the Hon. Michael Connelly, said recently. Mr Connelly was commenting on the latest furore over renewed efforts by the N.Z.F.S. drastically to reduce noxious animals from a high country station against the owner’s wishes.”]

Office holidays

Head office will close at noon on Christmas Eve, 24 December, and reopen on Wednesday, 5 January.

To dispose of as much annual leave as possible during the holiday period only restricted hours will be worked from 5 to 14 January, and members wishing to call at the office should ring before doing so (phone 726-254 or 728-154).

More help can be given in town and country planning

GREATER participation by the Society in town and country planning is the plea made in this article by Peter Crawford, who comments on points made on the subject by Josephine H. Lee in the February issue of *Forest and Bird*. The author is planner for the Taupo County Council, which is encouraging groups with special interests in the district to consider planning policy. He urges the Society to use its specialist knowledge and help the planners and so avoid a barrenness which could otherwise affect the quality of life in this country.

SECTION 21 (2) of the Town and Country Planning Act 1953 provides for a statement of planning policy. Few people, including those in local government, have realised the power potential and the significance of this statement. Briefly, planning policy is a notice stating what a community, through its council, wants to achieve and how it intends to achieve it. The effect of such a statement is binding not only on owners of land but also on the council. Moreover it is binding on the Town and Country Planning Appeal Board in times of dispute.

The Royal Forest and Bird Protection Society can greatly assist a local council in the development of a useful and practical district scheme if it is prepared to involve itself in this new and important area of planning.

Good policy planning

The art of good policy planning is the preparation of succinct statements based on fundamental facts. Such facts need to be thoroughly researched by persons who have both knowledge of and respect for their subject. In this respect the Society has a basic role to identify and isolate

those facets of the community on which it places value. Further it must be prepared to

Seasonal greetings

THE national President, Council and Executive, and head office staff extend to all members warmest greetings for the festive season.

We hope that you and yours will have the opportunity to get away and enjoy some of the beauty spots that still abound in our lovely country.

place this information before the local planning authority.

Too frequently it is assumed that the authority in its wisdom is capable of recognising the inherent value of things within its jurisdiction, and too often the authority assumes this role. Rather it is for those bodies within the community, created with particular objectives to bring such matters to the notice of the authority. If these bodies were to have such information before disputes, the organisations in general,

and the Society in particular, would play a more dominant and successful role in objection and development of community planning.

Reserves

An examination of the Society's brief indicates a concern for flora and fauna; moreover it encourages scientific study of them. A study of any district scheme and planning map indicates areas that have been set aside as proposed reserves, reserves for scenic purposes and reserves for recreation. Such designations place a dead hand on the land, permitting the owner few development rights and no opportunity to realise potential use, and the value of a reserve is therefore diminished. From the viewpoint of most authorities the obligation for the preservation and creation of open spaces is met.

However, a new viewpoint is emerging. This view is that through the statement of policy a clear indication of the proposed use of a reserve is given. An authority must be able to say, for example, that this reserve is necessary because it is the habitat of the rare native frog and that that reserve is needed because it contains the only remnant of rimu in the district. Because this is information known only to a few specialist interested organisations, it is an important area where groups such as the Society can assist the community.

Research and priority

Considerable local research into the critical areas of the environment is needed throughout New Zealand. Too often an area is set aside as a reserve for "environmental reasons" and the answers are thought of after the designation or during a dispute. Back-



LITTLE MANGERE ISLAND

and two of the world's rarest birds

Little Mangere Island, also called The Fort, is the small steep rock where the Chatham Island Robin (145 mm) is making its last stand.

This rarest of birds numbered only 12 in 1976. Accidental extinction is a risk and conservation is being considered on larger, adjacent Mangere Island.

Little Mangere Island also has the sole breeding population of Forbes Parakeets (280 mm), estimated at just over 20 birds. A large proportion of the Chatham island group's plants and birds has

been found only in the group. Many bird species became extinct following human settlement. Often wildlife survived only on the sanctuary afforded by other islets like Little Mangere.

It is birds such as the Chatham Island Robin and Forbes Parakeet that the Forest and Bird Protection Society are making special efforts to preserve from extinction this year.

ground information as to identification of species and the location of types of flora is becoming fundamental in the determination of reserve areas, types, and purposes.

If an authority can supply reasonable and practical reasons why land should be set aside and identify the purpose of such drastic action, a community can plan with confidence. In addition an owner of land is then fully aware not only of the reason for designation, but also of the objectives of the community. In a multi-purpose land use situation non-confliction uses can be identified and the owner can thereby be permitted some enjoyment of his land. The significance of such knowledge is that it allows both owner and authority to establish some priority and also gives a more practical assessment of reserve situations.

Zoning

Hitherto the concern for reserves has dominated land use planning. Today, occasioned by critical controls, new and exciting combinations of reserve open space and uses are being attempted. In new zoning types, such as special development zones, attempts are being made to preserve areas of flora and fauna in private property. Covenants, building easements, and building envelopes are a few of the techniques involved in land use preservation which complement the recent amendment to the subdivision statutes requiring the preservation of trees.

Further afield new ordinances are being created as soil conservation zones, soil protection zones, soil and water conservation zones, and soil and water protection zones. These new criteria are being created in the virgin field of rural planning.

The importance of the new zones is that in accordance with the terms of the planning statute they restrict uses for special purposes and control development. In contrast to the designation requirements they permit some use of the land, but do not require property purchase. In these areas the Society could be more actively pursuing its objectives to the benefit of all concerned.

Conflict

One of the curious features of human beings is that they find it difficult to establish a total framework in which to work. From observation of the Society working in the field of planning this conflict is very evident. This should not be the situation in which the Society finds itself, and Josephine Lee's article and others like it will assist. The point, however, is that the Society has precisely defined goals, and as such is able to supply information and ideas to a local planning authority which provide an administrative service to the community. It is not the task of the authority to seek this scientific information, but rather to seek those who know this information. The task of the authority is to assist such bodies as the Society translate scientific knowledge into planning strategy and allocate priority in terms of community management.

Strategy

New Zealand is desperately short of planners, that is, people with the administrative knowledge of town and country planning, and communities are therefore deficient in promoting development planning.

The Town and Country Planning Act 1953 is a unique piece of legislation which

allows a community to mould and develop its own environment in a pattern which will achieve a better way of life. However, unless such interested and affected organisations as the Royal Forest and Bird Protection Society are prepared to take the initiative under the terms of the Act, the future community will be the poorer.

Moira Cox photo competition

THE Moira Cox Memorial colour slide competition, started in 1970, will be held at the annual camp at Mt Ruapehu, which is being conducted by the Waikato Branch.

To participate members have to submit two nature topic colour slides (35 mm) each. The slides must be in the hands of the secretary of the Waikato Branch, Mr K. Mayhill, 10 Rutherford Street, Hamilton, by 15 December.

A panel of three judges will select the best 10 slides, which will be shown at the camp. A popular vote will then be taken to determine the best three.

The first prize is book tokens to the value of \$10, second is book tokens to the value of \$7, and third is a copy of "An Album of New Zealand Birds", by Lily Daff.

The results will be announced at the camp, and the prizes will be presented then if the winners are present. Results will be published in the May issue of *Forest and Bird*.

Miss Cox, who died in 1969, missed hardly an annual camp, and when one was held in each Island in the one year she went from one to the other.

Mr A. W. V. Reeve retires

Mr Arthur Reeve, the Society's public relations and training liaison officer, is retiring at the end of November after some 4 years' employment in the Society.

Mr Reeve retired from an administrative post in the Post Office in 1971 and at the request of Mr R. C. Nelson, former President, came to assist the Society with its public relations and promotional work and in particular with the organising of the fiftieth jubilee celebrations.

He was then asked to organise the indigenous forest petition — often called the beech forest petition — which he did so efficiently that in the fairly short time the Society was given to get signatures it presented to Parliament the second largest petition re-



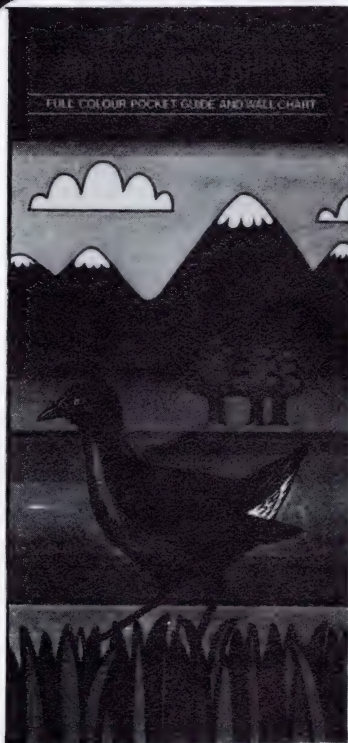
Mr Reeve.

ceived up to that time. In fact, only our own Manapouri petition has exceeded the number of signatures. Mr Reeve has brought much drive into the Society at head office level, especially in the efforts to increase membership, which have been so successful.

He has been an energetic member of the small head office team and this year

organised the highly successful Maud-Mangere Islands rare bird appeal. He was also responsible for having a questionnaire circulated on the desirability of a Society lapel badge, which he then had designed and produced; this is proving popular.

Mr Reeve has many other interests, among which are the Boy Scouts, of which he is an International Scout Commissioner, and the New Zealand Institute of Public Relations, of which he is a fellow and secretary of the Wellington Branch. He is leaving the Society only because he wants more free time. He will continue to help in a voluntary capacity or when there is some special project to be pursued. He thanks all who have assisted him and looks forward to continuing his interest in the Society.



IDENTIFICATION GUIDE to NEW ZEALAND BIRDS

with text by Brian Ellis
and drawings by Avis
Acres.

A full colour identification chart of sixty of New Zealand's most common birds with brief notes about each. Fits into a back pack when folded (13½ x 6") or onto a wall as a chart (13½ x 36").

'... provides a clear account of the physical characteristics, calls and habitats of native species ... of use to ornithologists young and old.'

Timaru Herald

'... achieves well what it sets out to do, namely, to aid in the identification of our more common birds.'

N.Z. Forest and Bird

'... will appeal to keen young nature study students and holiday-makers'.

N.Z. Financial Times

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Support for the planting of eucalypts

IN the light of the comments made in the August issue of *Forest and Bird* by Mr D. G. Collingwood, the national conservation officer, about the planting of eucalypts a recent Press statement issued by N.Z. Forest Products Ltd. is pertinent. The statement is abridged below.

THERE seems to be tremendous potential for the eucalypt here—initially from a pulping point of view to replace tawa and in the long term for both pulp and timber. As the result of an international tour to study eucalypt plantations and silvicultural techniques in Australia, South Africa, Brazil, and Chile, a biologist of the company is convinced of the future of the species in New Zealand.

Mr Barry Poole, investigations forester, who undertook the study tour, paid close attention to nursery techniques and genetic improvement programmes in all countries.

Faster growth

"Eucalypt is one of the few alternative species that can match *radiata* pine in growth rate and volume and, provided it gets the right cultural treatment, it can grow faster than *radiata*," he said.

"In both South Africa and Brazil, short-rotation eucalypt cropping is widely practised, often with astonishing results.

"Much growth is achieved in both countries by elaborate land preparation, plus fertilising, and sites are generally kept weed free mechanically or manually.

"This heavy early investment pays off with shorter rotations and in both countries it is not uncommon to

see eucalypts reaching pole size in only 7 years.

"They are all growing seedlings in containers for quick turn-around and good survival rates in the field, but nursery operations are labour intensive, and some streamlining would be needed here.

Seed selection

"They are also doing much work on seed selection from

'plus' trees to improve vigour, form, and uniformity and are getting about 10 to 15 percent increases in volume from just one selection," he said.

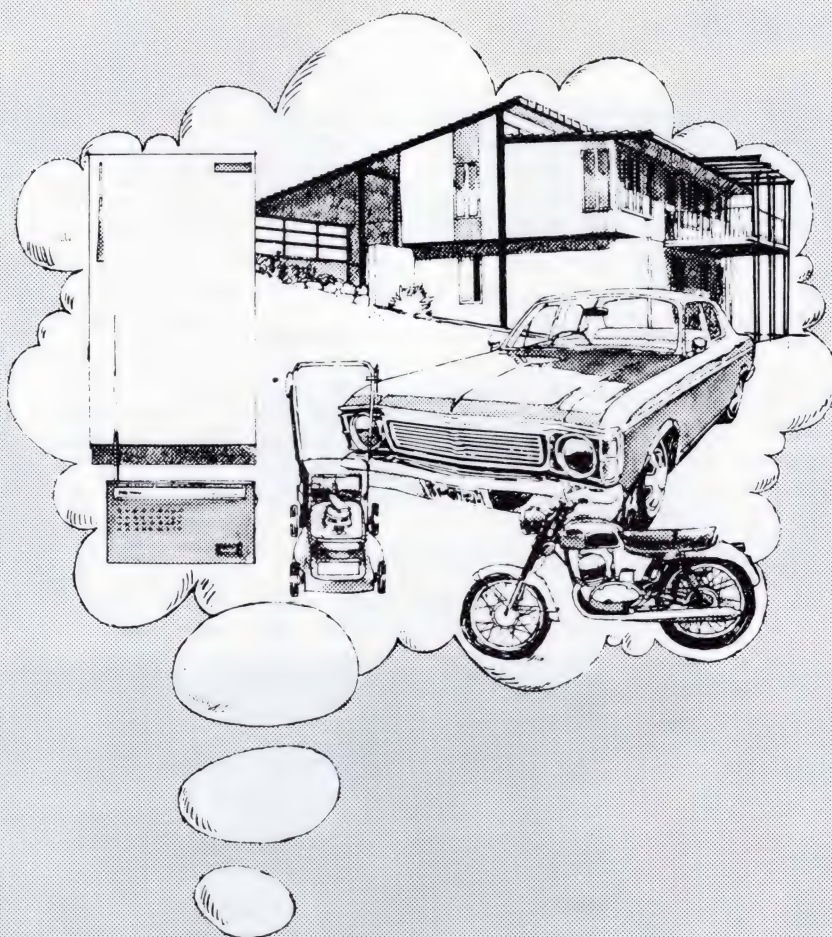
Mr Poole was convinced that eucalypts being grown by N.Z.F.P. compared favourably with those overseas, particularly when our colder climate and more difficult topography were taken into account.

"We have learnt a lot about the species in recent years and some of our plantations are not good examples of what we can achieve in the future.

"The company started eucalypts in earnest in the early 1970s and by the end of this year will have about 2000 hectares of established eucalypt forest. Planting is expected to continue at a rate of an additional 800 hectares per year."



Mr Barry Poole examining young eucalypt seedlings at the Kinleith mills of N.Z. Forest Products Ltd.



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Wekas an added attraction at Bushy Park

BUSHY PARK now has 22 wekas as the result of help from the Wildlife Service. Negotiations to obtain some birds for the park were started some time ago and full co-operation was given.

News of the arrival is extracted from a letter: "Our wekas have now arrived from

Gisborne and have settled down very well in their enclosure. Instead of taking delivery of the birds at 9 a.m. from the Railways, we were unable to pick them up before 1 p.m. I have no idea what time the previous day the birds departed from Gisborne, but they travelled very well in

their elaborate crates, four to a crate."

The wekas will be an added attraction to the peacocks at Bushy Park, and of course, as soon as the weather settles down the work in preparing the wetland area will begin, as all formalities have now been completed.

World marine park

THROUGHOUT the world there are more than 175 marine parks and reserves of widely varying quality and degree of protection, but there is only one world marine park. It is Manuae Island, presented last spring "to world science and for the benefit of mankind" by the Cook Islands, a self-governing dependency of New Zealand. The coral atoll consists of two islets and a lagoon, with a combined area of 8.5 square miles. It was the first island discovered by Captain Cook and remains today as he found it.

—Audubon, November 1975, page 136.



D. G. Collingwood photo

Juvenile wekas at Bushy Park.

Bequests to Society

The Society has received a number of bequests recently and you may wish to consider helping in this way to keep New Zealand beautiful.

Is there any cause more worthy of bequests by public-spirited citizens than the objectives of the Royal Forest and Bird Protection Society, which is working wholly and solely for the welfare of New Zealand, present and future? Here is a suggested form of bequest:

*"I give and bequeath the sum of
to the Royal Forest and Bird Protection Society of
New Zealand (Incorporated) and I declare that the
receipt of the secretary for the time being of the
said Society shall be a complete discharge to my
executors of the legacy hereby given to such
Society."*

Articles for Forest and Bird

Contributors to *Forest and Bird* are requested to submit articles in double-spaced typescript in which only one side of the paper is used. If articles have to be supplied in handwritten form through inability to have them typed, they should be written on only one side of the paper and a blank line should be left after each line of writing.

Each photograph submitted should be accompanied by a caption describing the subject illustrated and captions should be combined as a separate list. Prints heavily written on with a ball-point pen or sharp pencil can become so badly defaced that they are not usable. Similar damage can be caused by paper fasteners, which contributors are advised not to attach to photographs.

THE JUNIOR SECTION*

The ways of the pukeko

THE pukeko is an endearing, if cautious, clown of wetlands to the passer-by, but needs all its caution to escape its many enemies.

ITS indigo blue breast, iridescent black head, back, and wings, white undertail coverts, and bright red bill and frontal plate make it conspicuous to its enemies. It has very long feet to enable it to walk on swamp surfaces and these seem to get in the way when it runs. It flies, swims, and dives efficiently, but in an ungainly fashion.

The pukeko, *Porphyrio melanotus*, is one of the commonest members of the rail family, of which the weka, takahe, rails, and coots are less commonly seen. As it is at home in pasture, its numbers have increased with the spread of settlement and farming.

Writers' interest

The antics of pukekos have attracted the interest of a number of our writers. The explorer Charles Douglas thought they walked like a man in tight boots and dived only after much peering about and exaggerated precaution.

Guthrie Smith, in "Birds of the Water, Wood and Waste," has an entertaining account of hearing young pukekos, of which "Budget" was the most attractive:

"A baby pukeko is indeed the oddest little creature, grovelling on his belly when

approached, shivering his pinky half-bald head from side to side, his strange nude winglets outspread and backwatering, his eyes turned upwards like a Saint in a picture and his great red mouth open like a fern owl's."

E. F. Soper, in "More New Zealand Bird Portraits", thinks they behave like Charlie Chaplin, the great comic actor of silent films:

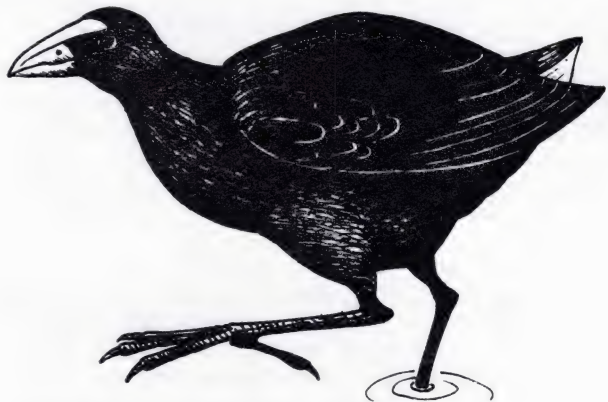
"To begin with the bird is suspicious of danger. . . . Suddenly the 'double-take' . . . done at times to perfection. The intruder is sighted! Head down, body forward, and running like a hare, the bird streaks through the rushes twisting this way and that way, its zigzag passage marked by the swaying reeds as if it were running in full view."

By Roger Chorlton

A rescue

Common enemies of pukekos are harriers, ferrets, stoats, and weasels. The farmer himself and sportsmen account for a number of birds. Pukekos are wily foragers in farm crops and so are not fully protected, though many bird lovers would like to see them have full protection. Adults of the group will rush to the aid of any bird attacked and will fly up at harriers.

The story told in the box on the next page describes the rescue of some pukeko chicks which had been attacked by a predator. My two young friends who tell the story did well to save the orphans. They would have done as well to leave them if other adult birds had been about, but the chicks were deserted.



The pukeko has a blue breast, black head, back, and wings, white undertail coverts, and bright red bill and frontal plate.

* Sponsored by the J. R. McKenzie Trust.

Sociable birds

Mr Soper thinks pukekos have aroused the interest of writers because they have sociable habits rather like human beings. Biologists need to be on their guard against treating other species as if they were humans. This attitude can lead to errors in studying the reasons for some kinds of behaviour in birds. However, human beings have enough in common with birds, I think, to interpret their behaviour in an understanding way with some fellow feeling. We can refer to our bird books to confirm our ideas.

Breeding

Most birds breed in pairs (monogamy), but pukekos often breed in groups like poultry (polygamy). They may build partnership nests of up to 18 eggs, laid by several birds, or double nests, which may also be shared. Both male and female birds brood the eggs. The males seem to take the larger share of the task, but all adults of the group may share it.

The eggs take about 24 days to hatch, and hatching may go on for several days, depending on the age of the eggs. You can tell when these eggs belong to different females because of characteristic variations in colour and shape of the eggs from each bird.

Rearing young

The young pukeko is covered with silver-tipped dark down. It is active as soon as it hatches and will tumble out of the nest and hide if alarmed by an intruder. As the nest is usually built in water in a clump of reeds or rushes, a hiding place is easily found.

The young are fed by all of the adults in the group. They feed for themselves on swamp plants at about 10 days old,

A rescue by chance

MY cousin Evan Davies and I go on bike rides in the country near Masterton. During September last year we went for a ride to a country area called Matahiwi. After biking for 6 miles we left our bikes by a fence and went into a paddock which had some bush and some trees in it. There was also a creek nearby.

We had lunch and then decided to explore the creek for eels. We were walking along when all of a sudden we heard a lot of squawking. Then we saw some chicks. We did not know what species they were until we saw the mother lying dead in the creek. Then we realised they were pukekos. There were five chicks; two were drowned and three

were in the nest, which was made in a clump of reeds with herbage on the top to make a surface for the chicks to lie on. We picked up the chicks and wrapped them in a jacket to keep them warm. We went back to the bikes and headed for home.

We showed them to my mother and she told us to go down the road to Mr Stidolph's house. He is an ornithologist and has written books and articles on many different birds. Over a period of about 3 months the birds grew from 3 in. to about a foot high. Then they were sent off to Wellington Zoo. We called them Pu, Ke, and Ko. You can still see them at the zoo. — Ross Brader

but take food from adults until several months old.

Extra platform nests are built by adults, which brood the young for some months. A second clutch of eggs and a third may be laid in a season at intervals of a month or two. Often the young of the first clutch will feed newly hatched chicks.

Guthrie Smith tells how Budget became a devoted nurse to three younger pukeko chicks:

"Even when we know him to be hungry, it is never himself who is first fed and the distribution of chopped meat pukekos love is a quaint spectacle. One of us presents it bit by bit to Budget, who duly passes it on to one or another of his little troop till they are gorged, standing round the dish replete, like sated cobras, and their small tummies tight as very drums."

Recently I had a dam made in the stream on my land in the hope of attracting some water birds. A pair of ducks have taken up residence and I hope that they will nest there. If any more orphan pukekos are found by my young friends, I hope to give them a home.

Things to do

1. Look out for pukekos when you are travelling by car or train. You can often see them in swampy areas, drains, or dams near the road. They are not frightened of vehicles a reasonable distance away.
2. If you are lucky enough to find a nest, count the eggs or take a photo. Do not touch the eggs or disturb the nest.
3. Look to see whether there is a pair or group mating. Is there a single, partnership, or double nest?

ROYAL FOREST AND BIRD PROTECTION SOCIETY OF NEW ZEALAND INC.

(FOUNDED 28 MARCH 1923)

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SOCIETY'S LODGES AND HOUSES

Tautuku Lodge

Situated 45 miles from Balclutha on State Highway 92, Tautuku Lodge on the Society's 1,360-acre bush-clad Lenz Reserve in coastal south-east Otago is the place for that weekend or holiday in beautiful, peaceful, unspoilt surroundings.

The reserve has interesting bush walks, and native birds are numerous. The round track is a comfortable 4 hours' walk, and as this is in its formative state, visitors are requested to keep to the marked track route.

The lodge is fully equipped and accommodates eight or nine people. It has a lounge, kitchen, two bunk-rooms with innerspring mattresses and foam rubber pillows, washroom with tub, basin, and shower, and an ablution block with toilets, basins, and showers. Charges are moderate, as shown below.

The cooking facilities in the modern kitchen are excellent.

Bring with you all food supplies, bed linen, and pillow cases, blankets, towels, tea-towels, etc.

Bookings are accepted up to 9 months in advance. No refunds are made unless cancellation is advised at least 1 month before reserved occupancy.

New rates from 1 October, 1976

Rates per night are:

Senior members, \$2.50*.

Junior members, \$1.

Senior non-members, \$4.

Non-members (5-17 years of age), \$1.50.

A deposit of 50 percent is to be made with each booking.

For free brochure and all bookings apply to Mrs F. B. Bennett, Papatowai, R.D. Owaka. Telephone 160M.

Turner Cottage

The Turner Cottage, on Stewart Island, is available for renting. The cottage, a one-roomed dwelling furnished for three people, can be obtained at a rental of \$4 a day for members and \$6 a day for non-members.

For details write, enclosing a stamped addressed envelope, to:

"Turner Cottage", P.O. Box 1155, Invercargill.

Bushy Park, Kai Iwi

(15 miles north of Wanganui)

Fine old homestead, lovely grounds, 220 acres of native bush.

Make your own programme. Electric stove, hot water, and other facilities available. Bring your own rations. Bedding supplied. Linen and towels \$1 per bed.

Fees: Members, \$3 per night; non-members, \$4 per night; children under 15, half rates.

Custodian: C/o Bushy Park homestead, post office, Kai Iwi, via Wanganui. Telephone 49-734 Wanganui.

The park is closed to daytime visitors on Mondays and Tuesdays.

Ruapehu Lodge

Ruapehu Lodge is available to members and guests for occupation. To avoid double booking all bookings must be made with the Society's head office, P.O. Box 631, Wellington.

Fees: Winter season (1 June to 31 October), \$3.50 per night for all persons of all ages.

Summer season (1 November to 31 May), adult members, \$2.50; junior members, \$1.50; non-member guests, all ages, \$3.50.

Bookings: Bookings may be made by members, sections, and branches 9 months in advance.

A deposit of 20 percent (70c per person per night) is payable on application and the remainder not later than 6 weeks before occupation. The full amount has to be paid with bookings made within 6 weeks of occupation.

If bookings are not confirmed by the due date, the space may be relet.

Refunds are subject to \$10 surcharge.

The deposit receipt will be returned with an instructions sheet listing suggested equipment which should be taken on the trip: Tea-towel, torch, sleeping bag, blankets, sheets, and slippers or light shoes. A pillow case is essential.

The wearing of boots inside the lodge is not permitted. No animals or pets are allowed in the park.

Any person occupying the lodge without prior booking must immediately remit the proper fees to the booking officer.

Waiheke Island Cottage, Onetangi

The cottage has comfortable bunk accommodation for eight people and has electric lighting, stove, refrigerator, and hot water. Adjacent to a 121-acre wildlife reserve, it is an easy walk to shops and the beach. It is reached by ferry from Auckland City (two or three return trips daily) and by bus or taxi from the island ferry wharf. Everything is supplied except linen and food. **No animals are permitted.**

Summer (mid-October to Easter, inclusive)

Nightly (other than weekends): \$2 per person per night.

Weekends: \$12 minimum. More than 2 adults, \$2 per person per night.

Weekly: \$30 minimum. More than 2 adults, \$2 per person per night.

Winter (after Easter to mid-October)

Nightly (other than weekends): \$1.25 per person per night.

Weekends: \$12 minimum. More than 3 adults \$1.25 per person per night.

Weekly: \$20 minimum. More than 2 adults, \$1.25 per person per night.

Children 15 years and under: First two, half rates; others, no charge.

A deposit of 50 percent is payable on booking, the remainder before entry.

Booking Officer: Mr K. A. Lake, 40 Kildare Avenue, St Heliers, Auckland 4. Telephone 558-859.

* All charges on this page are subject to alteration from time to time.

What use is a forest



Watershed protection, soil stabilisation, timber production, wildlife conservation, scenic preservation, recreation ... these and more are the uses of a forest.

The New Zealand Forest Service recognises all forests possess manifold values which must be safeguarded and enhanced through management. That's our job.

Weighing all these conflicting but legitimate claims on New Zealand's forest resources. Researching, evaluating and consulting to determine priorities, initiate action and monitor progress. Continually reaching for the best use of our forests — for every section of the community.

The New Zealand Forest Service.

